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Notes on the Wet Extraction of Copper.

By ALEXANDER TRIPPEL.

CONTINUED FROM PAGE 114.

The HUNT and DOUGLASS process is based upon different chemical reactions, although the mechanical manipulations are similar to the other. The chemical facts are these :

A strong solution of proto-chloride of iron dissolves oxide of copper and produces a mixture of proto and di-chloride of copper, soluble in water and a strong brine of common salt, the iron being thrown down as an insoluble peroxide.

The soluble copper salts are precipitated by metallic iron. In this case, two equivalents of iron will precipitate three of copper, according to theory, or 100 parts of copper would consume 59 parts of iron. There are, however, several causes for irregularities in the quantity of iron used, so that in practice it will come near 66 to 70 of iron for 100 of copper. This result is a very favorable one, compared with any other known method, where iron is used for precipitation, and where the loss of iron amounts to 150-200 for 100 of copper.

It must be noted, that the use of iron in this process is indispensable to regenerate the proto-chloride of iron used as a solvent for the copper. The mechanical manipulations consist in the roasting of the finely pulverized ore in a reverberatory or muffle furnace, after which it is removed to vats, provided with mechanical stirring apparatus, and filled with a brine of proto-chloride of iron. The whole mass, being kept hot and stirred for several hours, is allowed to settle, when the liquor is decanted, and the residue again washed. The liquor, after being clear, is conducted in tight vessels over metallic iron, where the copper is precipitated. It is claimed by the inventors that an operation can be completed in 24 hours, which certainly would be satisfactory for promptness.

The chemical used in Messrs. HUNT and DOUGLASS's process is common salt (sodium chloride) ; its actual consumption beyond the first use for making the bath or brine, is small, being limited, as in MONNIER's, to unavoidable waste. Yet, it has been found necessary to resort to the use of gaseous sulphurous acid, or in other cases, to the use of lime, to preserve or restore the necessary quantity of proto-salts of iron in the dissolving brine, manipulations which are not without some inconvenience.

Since Messrs. HUNT and DOUGLASS, in the description of their process have made some allusions to the MONNIER process, I may be permitted to make a few remarks on their comparison.

Dr. HUNT fears that MONNIER's method involves a great expenditure for fuel, in evaporating his liquors. This is not the case. Where the pyrites are reasonably rich in sulphur, the fire used for roasting is almost nominal, and certainly much less than that used for the same purpose in HUNT's ; the fuel used for evaporation, even if it is much more than that for roasting, will hardly be found much more than what will be used to keep the baths hot, in the other process, while experience has already shown, if I am well informed, that concentration of the brine by evaporation will have to be resorted to in the latter. I am not prepared to make exact comparisons, but whatever the difference may be, it will be slight.

It is quite correct that the sulphate of soda has no *dissolving* power on unoxidized copper, or on sulphides, but the deficiencies are well supplied in the roasting process, by the presence of a bi-sulphate of soda, provided proper time is allowed for roasting, and an approximately correct temperature.

Two advantages, which cannot escape attention, are found in MONNIER's process ; the much more easy lixiviation of the soluble salts in the ore, by which a great concentration of the liquor is effected which limits the evaporation of the same considerably ; and the system of reducing the sulphates to protoxide and metallic copper without the use of iron, making it practicable in many locations, where iron could not well be procured.

Undoubtedly, both of these processes have great merits and deserve the attention of parties interested in copper mining, and metallurgists, especially as they can be extended, with proper modifications, for the treatment of ores of several other metals, with more economy than the smelting process.

As before remarked, these two methods of hydro-metallurgical treatment of ores represent two systems, outside of which it is not probable that a third one could successfully be introduced, unless it be an imitation of either MONNIER's or the HUNT and DOUGLASS.

The British Copper Trade.

From GRYLL's annual mining sheet we gather some information about the extent of the copper production in Great Britain, from June 30, 1871, to June 30, 1872. The product of English and Welsh mines was 86,612 tons. The purchases in Cornwall and Wales amounted to 86,886 tons (of 21 cwts.). This was 9,294 tons less than the purchases of the year before ; and the product was 7,436 tons of fine copper, or 1,276 tons less than the make of the year before.

From these figures it is apparent that the average yield of the ores was 8.5 per cent. in 1871-72, and 9.05 per cent. in 1870-71. Prices, however, have gone up. In 1870-71 the average value of the ore was $26.80 a ton, taking the pound sterling at $4.84. In 1871-72 it was $31.80, an increase of 18.6 per cent. The amount of ore worked up by the different copper companies in the year 1871-72 was as follows :

Purchasers.	Ore (21 cwt.)	Tons copper.	Amount.
Vivian and Sons	17,256..	1,196 15..	£87,590 14 8
Pascoe Grenfell and Sons	8,703..	859 19..	65,780 10 2
Syms, Willyams, Nevill, and Co.	9,351..	891 19..	67,237 18 4
Willyams, Foster and Co.	18,320..	1,921 19..	153,020 12 4
Mason and Elkington	12,181..	870 12..	63,668 11 9
Copper Miners' Company	7,660.	457 2..	34,019 10 1
C. Lambert	3,959..	346 14..	28,492 13 10
Newton, Keates and Co.	398..	28 5..	1,738 1 0
Sweetland, Tuttle, & Co.	6,309..	617 0..	46,967 14 3
Bede Metal Company	2,081..	107 6 .	8,676 14 0
Brittish & Foreign Copper Co.	133..	38 8..	3,135 10 6
Landore Copper Company	478..	90 15..	8,513 15 10
Ravenhead Copper Co.	57..	20 6..	2,030 12 6

Beet Sugar Manufacture.

The New Jersey Legislature at its last session passed a law in favor of beet-root sugar manufacturers, which says :

1. Be it enacted by the Senate and General Assembly of the State of New Jersey, That for the term of ten years next after the passage of this act, all the machinery, buildings, real estate, and all other property owned by any individual or individuals, corporation or corporations, organized under any law of this State, and used exclusively in the business of manufacturing beet sugar, are hereby exempted from taxation for any purpose whatsoever, provided that this exemption from taxation shall not apply to lands upon which beets are raised for the purpose of manufacture.

2. And be it enacted, That the stock of any incorporated company engaged exclusively in the manufacture of beet sugar in this State, held and owned by any individual or individuals, shall be exempt from taxation for any purpose for the time specified in the first section of this act.

3. And be it enacted, That this act shall take effect immediately, and be in force from and after its passage.

If this industry does get a foothold in this country, the science of practical chemistry will receive an immense accession of strength. Chemists are a necessity to these establishments, and the encouragement given to science by the employment of a few hundred additional men would be exceedingly gratifying to all who appreciate its importance.

The Corundum Region of Georgia and North Carolina.*

BY PROFESSOR SHEPARD, OF AMHERST COLLEGE.

(CONTINUED FROM PAGE 116.)

After this outline of the leading geological features of the corundum formation, we proceed to speak of it mineralogically ; and first, it will be appropriate to treat of the constituents of the chrysolitic rock. As a whole, it has nothing but color to assimilate it to serpentine. Indeed it more resembles a certain fine granular variety of epidote—its color often bordering on pistachio-green. Even where most exposed to the weather, its hardness=5·0 to 5·5 ; and in no instance, so far as I have seen, does it emit, on being moistened, the peculiar odor of serpentine. Where a partial decomposition has taken place, we only see a thin crust or coating of a ferruginous powder on the surface. Nothing soft or talcy appears, or any change indicating a metamorphosis to serpentine. Though usually quite homogeneous, it still contains in places considerable grains of true chrysolite, having the hardness and other properties of the unchanged species. It also embraces occasional broad bladed crystals of that variety of anthophyllite known as gedrite ; and also has diffused through its mass, very generally, minute octahedral crystals of chromite. Almost the entire aggregate, however, consists of what some would denominate an altered chrysolite, while others again may prefer to regard it as having been originally formed as now found. It has the following characters : Color yellowish olive green ; structure fine granular to compact ; lustre glimmering, vitreous. H.=5 5 to 6·0. Gr.=3·04 to 3·06. When heated to redness in powder, it turns

* From the American Journal of Science and

pale cinnamon-red. Infusible. Easily attacked by hydrochloric acid, with which it forms a stiff semi-transparent jelly. Composition:

Silica	41·49
Protoxide of iron	8·62
Magnesia	44·00
Water	5·69
	99·80

with traces of the oxides of chrome and nickel. The foregoing characters obviously place this abundant mineral under the species villarsite.

The mineral next in importance is the green chloritic one already mentioned as the immediate gangue of the corundum. It is that variety of chlorite called ripidolite. Much of it, even to a depth of 50 feet at the Culsagee mine, assumes a light pinchbeck brown color, constituting that modification of vermiculite (itself a hydrated ripidolite,) called jefferisite. This brown mineral is in broad, highly crystalline folise and crystals, often attached to, and forming portions of unaltered ripidolite, in which cases they are softer and more easily cleavable than the latter mineral. From this condition, they pass insensibly to a pulverulent, scaly, clay-like aggregate, much resembling the original vermiculite of Milbury, Mass., except in possessing a lighter color. The ripidolite has a blackish grass-green color, closely resembling that of the corundophilite, but unlike the latter, it emits on being breathed upon, the peculiar chloritic odor; and, before the blowpipe, exfoliates, turns white and fuses on the edges into a grayish white glass; whereas corundophilite does not exfoliate, but turns black and melts on the edges into a black magnetic glass. The vermiculite (both varieties, the broad foliated and the fine pulverulent) exhibits on heating the usual exfoliation of the species. The soft and slightly coherent condition of the vermiculite where it happens to prevail in the workings, renders the separation of the corundum, especially that of the crystals, easy; whereas the ripidolite, when by itself, forms rather a tough gangue rock. Occasionally narrow seams of blue and white halloysite traverse the masses of vermiculite, among which also occur greenish-gray crystals of a softened hydrated arfvedsonite, a very ambiguous mineral, but recognized by its crystalline structure and easy fusibility before the blowpipe. Into this aggregate small scales of white margarite also enter.

The spinel appears to be confined to narrow irregular seams of a more closely grained ripidolite, mixed also with black tourmaline and corundum, which seams traverse irregularly the coarser ripidolite rock. Its color when massive is almost black, though its powder is blackish-green. Before the blowpipe, it gives the reaction of chromium. It possesses the peculiarity when in crystals (octahedra with truncated edges) of being thinly coated or varnished as it were, with a silky, pearl-gray envelope—giving them so much the aspect of the altered zircons from Henderson Co., N. C., as to have caused them at first to be referred to that species. This coating has about the hardness of steatite or agalmatolite, and probably also a composition approaching one or the other of these substances.

Quite different appear to be the minerals associated with the corundum of the Cullakenee mine in Clay County. Indeed the variety of corundum differs from that of the region generally. It is less perfectly crystallized, and has a delicate rose-red or pink as its prevailing color. The blue tints are wanting, so far as the specimens thus far submitted show; but a grayish-white, like that of common feldspar, is the most common shade. The most characteristic associated species would appear to be arfvedsonite of a grayish, brownish black color, often in crystals and coarse fibres interpenetrating the corundum. It also occurs in short crystals and even granular, of a rich grass-green color, coating or including small crystals and laminæ of the ruby—constituting a rock of much beauty. This green or chromiferous arfvedsonite much resembles the most highly colored variety of omphacite, or eclogite with garnet from Hof, Bavaria, but is quickly distinguished therefrom by its easy fusibility, attended with the soda colored flame so characteristic of arfvedsonite, in which peculiarity it precisely agrees with the brownish black and more perfectly chrystallised variety. Instead of the disseminated garnet in the omphacite, we have the beautiful grains of ruby in the present aggregate. Zoisite is the next most characteristic mineral of this locality. It occurs in pretty distinct crystals and columnar masses of a pure white or slightly grayish-white color, sometimes semi-transparent. The more massive variety is so intermingled with the corundum as often to be mistaken for feldspar. Albite is a third species that rarely enters into the composition of the corundum gangue. Margarite is wanting in the variety found in the green arfvedsonite, though a very deep sky-blue kyanite occasionally traverses the green aggregate in thin veins. It should be mentioned that this peculiar gangue of the red corundum shows a decided stratification like certain varieties of gneiss, that also embraces granular epidote, such as occurs at Grace Mountain, in Warwick, Mass.

The foregoing include all the species I have thus far had submitted to my notice, as belonging to the corundum formations under consideration. The specimens did indeed embrace single examples of a pale actinolite, a white radiating asbestus and an isolated crystal of rutile, as well as one of a large and very beautifully colored epidote, but I am led to infer that neither of these minerals are in any sense characteristic attendants of the corrundum of the region. One specimen of white, granular dolomitic limestone, containing scales of graphite, was sent, only as having been found in the vicinity of the Cullakenee locality.

(To be concluded.)

Petroleum in Alsace.

The value of Alsace to Germany, and the consequent extent of the loss to France, commercially considered, are alike enhanced by the probable development of a large petroleum industry in that celebrated province. Oil works on a small scale already exist in the valley of the Rhine, near the village of Schwatwiller, within and on the borders of the forest of Hagenau. A thick alluvial deposit has first to be penetrated, beneath which are alternating strata of indurated clay and micaceous sandstone, with seams of compact sand. These last named seams contain the petroleum, and are found at a depth of seventy or eighty yards. Indications of the presence of petroleum are observable in various parts of the forest, and bitumen is found and worked in the adjacent country. Borings to test the presence of the petroliferous sand have been multiplied to some extent, and in all cases with satisfactory results. The mode of working very much resembles that of a colliery, only on a much smaller scale. We believe that at present there are only two oil pits existing, and one of these is of very recent date. In fact the whole affair is in its infancy, but is most likely destined to undergo very great extension, so as to become of considerable importance. The pits are sunk in the ordinary way, and the seams of sand are worked by means of galleries, in a manner similar to that of getting coal. As the workmen cut their way through the compacted sand, the oil oozes out of it, running down the walls of the gallery on the floor, where it accumulates in shallow wells dug for the purpose. From these wells the crude petroleum is conveyed to the surface, to be properly treated. But this process of draining does not remove all the oil, and the sand itself is accordingly taken to the surface to be distilled in retorts. The crude oil which oozes from the sides of the gallery, and that which is distilled from the sand, are subsequently rectified by a further distillatory process, and the produce is understood to be in no degree inferior to the best American petroleum. In working the existing pits it is a singular fact that no water is met with. Of the extent to which the petroliferous sand prevails it would be premature at present to judge, but there seems no reason to doubt its presence over a considerable range of ground. Now that attention has been drawn to the subject, we may expect further discoveries to be made. It is reported that Mr. KEATES, the well-known analytical chemist, has recently visited the oil producing district in Alsace, and examined the works. So far as we can learn there is every prospect of the oil proving abundant. The cost of production, it would seem, is so moderate that the competition of American oil need not be feared, and the demand is such that Alsace will consume all she raises for some time to come, unless the produce is very largely increased.

It has been said that petroleum, as found in different parts of the world, is not confined to any particular stratum, and that consequently there is no such thing as a "petroleum rock," properly so called. Petroleum has been found in rocks of all ages, from the lower silurian to the tertiary period inclusive. The oil wells of the United States are for the most part sunk in the sandstones which form the summit of the Devonian series. The oil of Alsace, it will be observed, is limited to certain seames of compact sand, and it would appear that in this region the oil is found solely in these seames. It is a general theory with regard to the origin of petroleum, that it has been produced by the slow distillation, at low temperatures, of coal and other bituminous minerals. The theory would seem to accord with the fact already named, that bitumen in various forms is found in the country bordering on the oil region of Alsace. Further explorations in this territory may lead to still more important discoveries, and the commercial importance of the inquiry is one guarantee that it will not be neglected.—*The Engineer.*

Chemical Photographic Printing.

At KRUPP'S works, where drawings have to be reduplicated many times, a method of doing this by photography is used. It is the invention of Dr. LANDOIS, of the University of Münster. It consists in taking from any photographic picture a negative upon a very thick glass plate, in which the covering mass, sensitive to the light, is gelatine containing bichromate of potassium. After the picture has been produced by a sufficiently long exposure, it is fixed with liquid of ammonia, when, however, no picture is yet visible. It only appears after ink is brought upon it by the printing roller. In this way over 5,000 impressions have been taken from one single Landois plate. The value of such a method in a busy works is apparent. It was much used by the Prussian staff during the war. Evidently the printing must be of the lithographic order. What is wanted in newspaper work, is a method of photographic reproduction which can be used in an ordinary press, and with types. The inventor of that process will certainly meet with his reward. Such methods do exist but they are either so dear as to offer no advantage over wood engraving, or their work is not of a kind to be generally acceptable.

It is reported, on good authority, that the directors of Messrs. JOHN BROWN and Co., the great iron workers of Sheffield, have purchased the Aldwaike Main and Carr House Collieries, near Rotherham, and will work them for their own supply. The workings of the two pits are connected, and the total daily output is over 1,500 tons, about 700 men being employed.

Mr. H. BROWN, the well-known coal merchant, of Pittsburgh, is having built for him a coke barge 200 feet long, 30 feet wide, and 12 feet deep, with capacity for 100,000 bushels. When finished this will be the largest barge afloat.

It is said that the Central Pacific railroad has raised the value of real estate along and near its lines more then $30,000,000.

NOTES ON A METALLURGICAL JOURNEY IN EUROPE.

By JOHN A. CHURCH, E. M.[1]

The Copper Process at Agordo.

AGORDO is reached from Venice by rail to Conegliano, stage to Belluno and post-chaise to Agordo, the whole journey occupying about eighteen hours. The old process in use at this place has been fully described by RIVOT, in his work on Metallurgy; by HATON, in the *Annales des Mines*, 1855, 5th series, vol. 8; by PERCY, in his metallurgy, and many other writers. It will, therefore, receive only such attention here as is necessary to make the character of the recent changes sufficiently clear.

The ore is obtained from an irregular deposit of iron pyrites, lying in black argillaceous schist, close to the contact plane of a dolomite limestone. The dimensions allotted to this mass by Engineer PELLATI, are:

Length, meters	550
Breadth "	35
Depth "	200
Contents in cubic meters	1,764,000

He reports the state of the work in 1865, as follows:

Content of mass, cubic meters	1,764,000
Already excavated "	617,000
Worthless pyrites "	441,000
Good ore remaining "	700,000

As the weight of one cubic meter of pyrites is 4,250 k. (9,350 lbs.) we have about 3,000,000,000 kilograms, or 3,000,000 tons. The present production is about 20,000 tons a year, at which rate the mine will hold out a hundred and fifty years.

About one-third of the ore (see above statement) is worthless, containing no copper. This is sorted out, and the remainder is separated into the following varieties:

Best ore, with 4 per cent. copper.
Good ore, with 2—4 per cent. copper.
Poor ore, with 0·4—2 per cent. copper.
Small ore, with 1—2 per cent. copper.

This small ore is composed of a mixture of all the other varieties, and also of ore from a particular layer in the mine. It forms somewhat more than 15 per cent. of the whole.

Besides the pyrites a small amount of galena mixed with blende and containing a variable percentage of silver, is obtained. At the time of my visit, a gentleman had purchased a few hundred tons of this ore and was roasting it in piles, in the hope that the blende would roast to sulphate and thus be soluble. It has been ascertained that when a mixture of lead, zinc and silver sulphides are roasted together to sulphate, the silver is not soluble in the presence of so much lead. His roasting, therefore, had for its object the removal of the zinc and the concentration of the silver in the lead; but I have never been able to ascertain what success he had, though I am under the impression that his experiment failed.

In treating this mass, remarkable for its purity, methods were adopted which made Agordo the study of scientific men. The ore was roasted in heaps containing 250 to 300 tons, the temperature being kept very low, and after six to nine months, when the pile was opened, a kernel of unroasted ore was found in each lump. In this kernel was concentrated most of the copper which in the beginning had been distributed throughout the lump. A transmission of solid matter so remarkable as this, illustrating the operations by which metallic matter may be concentrated in veins by mundane fires, could not fail to attract attention, and nearly all writers on the metallurgy of copper, and processes of roasting, have discussed it. These kernels were broken from the surrounding "shells," and in this way kernels of a working average of 4—8 per cent. copper were obtained from ore containing 2 per cent. and less; while the shells would contain about 0·7 per cent. The concentration of copper is so perfect that the real kernel often contains 30 per cent., but in order to make sure that none of the rich kernel shall be lost, a large quantity of shell is left around it, so that the working average is that above given.

Sulphur is collected in small depressions, stamped in the top of the pile. Fine, sifted ore, from the lixiviation vats, is stamped into semi-circular basins and a small quantity of sulphur, from one-fifth to one-half of one per cent. of the ores' weight, collects in them. This is refined in the usual way. It contains arsenic and is not a very valuable product. In 1865 the amount made was 50,532 k. or 50·5 tons. This is 0·3 per cent. of the ore or 0·6 per cent. of the sulphur in the ore.[2]

The treament of the two sorts was: Lixiviation of the shells with precipitation of the copper by iron, and fusion of the kernels.

THE WET TREATMENT.

Lixiviation. The ore is shovelled into vats 3·50 × 3·50 meters square and 1·50 meters deep; charge 14 tons. Fresh ore is lixiviated with liquor which has already served for two lixiviations, and in this way it is brought up to the proper strength. The liquor remains 24 hours in contact with the ore, is then drawn off, and the ore shovelled to a fresh tank, where it is treated with water from a previous third lixiviation. After 24 hours standing the process is repeated, this time with fresh water. After the third contact with the ore, the liquor marks 32° BEAUME. Liquor from the second lixiviation marks 13°—14° B. The spent ore is placed on and under a new roasting heap, where the sulphurous acid fumes effect a re-roasting of it. It is then washed in 4 waters, sifted through a mesh of 1·5 centimeters = 0·6 inch, and the coarse ore receives a third treatment in the piles.

Cementation. The liquor from the lixiviation vats is clarified by settling in tanks, and then run to the cementation vats. These are of two kinds: lead tanks 4 × 3 meters and 1·5 meter deep, containing 21 cubic meters. They are heated by a lead stove placed in the center, and the flames of which pass downward through a large flue in the tank. Fire is kept up for 8—10 hours, but the liquor remains 24 hours in the tank. Pig iron is placed in a bank around the sides of the tank. The temperature reaches about 60° C. Reverberatory furnaces are also used for this work. They have a bottom laid in hydraulic cement, hold 17 cubic meters, and the liquor is heated by the flames passing over it.

Crystallization. After the cementation is complete, the liquor runs to clarifying vats where the fine copper, and the basic salts in suspension in the liquor settle to the bottom. It then marks about 37° B. and is transferred to the crystallization vats, which are wooden tanks, some being 2·20 × 3·00 × 0.50 meters, and others 3·30 × 3·50 × 0·50 in size. Here the liquor remains as long as it is desired to continue the deposition of crystals. Agordo is cold in winter and dry in summer; and as crystallization practically depends partly upon evaporation and (mostly) upon the depression of the temperature, the place is well fitted for the manufacture of copperas. By leaving the liquor in the vats three or four months, the greater part of the iron sulphate could be obtained. But the production of Agordo is far in excess of the demand, so that there is no need to push the extraction so far. Practically the liquor remains 3—6 weeks in the vats. The crystals of sulphate collect on the bottom, on twigs suspended in the liquor, and on the sides of the tank, and these conditions afford three qualities of copperas. That collected on the bottom is the poorest, being contaminated with basic iron sulphate, which is insoluble, but is formed in such a fine condition as to separate completely from the liquor only after long standing. The copperas on the twigs has a certain amount of bark and woody matter in it; that on the sides is pure and of a fine color. If the tanks do not yield enough of this quality to satisfy the demand, the mother liquor, after the first crop of crystals has been obtained, is concentrated in the reverberatory furnaces. It then yields altogether first quality crystals. In the ordinary process of crystallization the strength of the liquor sinks from 37° B. to 26° B.

The composition of this sulphate is as follows.

Ferric sulphate	49·73
Zinc sulphate	4·55
Hydrated Ferric oxide	3·20
Water	42·52
	100

The amount of copperas which Agordo is capable of producing each year is immense. If we assume the percentage of ferric sulphate in the liquor to increase 0·064 per cent. for each degree of BEAUME, we have 0·704 per cent. which can be extracted from the liquor, by lowering its density from 37° to 26° B. That is, we have 774 pounds of ferric sulphate from each cubic meter of cement liquor. RIVOT says that each cubic meter will easily give 300 k. or 660 pounds. In 1865 Agordo produced 7360 cubic meters of rich liquor and 1967 cubic meters of poor liquor. The rich alone would yield, at RIVOT's estimate, 4416 tons of copperas. But the production for the year is reported at only 754 tons. Agordo is so far from a market that its profit on this product is very small, and from its impure nature the demand is not great.

The operations connected with mining and the wet treatment, in 1865, dealt with the following quantities of material:

TABLE OF ORE MINED[3].

1.	Best ore containing 7·4 per cent. copper	843	tons	containing	62	tons	copper.
2.	Good " " 3·1 per cent. copper	5005	"	"	155	"	"
3.	Poor " " 0·87 per cent. copper	10531	"	"	92	"	"
4.	Small ore. { Good containing 2·48 p. c. copper	711	"	"	18	"	"
	{ Poor " 1·25 p. c. "	2261	"	"	28	"	"
		19,351			35		

Average percentage of copper 1·8

TABLE OF ROASTING.

The Roasting piles received bricks and fine ore for covering				4,356 tons.
coarse ore				17,403 tons.
Total				21,759 tons.
Wood consumed, cubic meters				201·61
" " cords				56·7
Labor	Roasting	2869 days		
	Breaking out kernels	39121 days		41990 days.
Per ton of ore:	Wood, cords			0·0029
	Labor, days: roasting	0·132		
	breaking	1·800		
		1.932		
Results:	Kernels	2,324 tons	containing copper	145·5 tons.
	Shells	17,667 "	" "	209·5 tons.
	Rich ore	475 "	" "	33·7 tons.
Total[4]		20,466 tons.		388·7 tons.

1. For information contained in these notes on Agordo, I am indebted to SIGNOR N, PELLATI, Engineer in charge for the Italian Government; and to SIGNOR LUIGI HUBERT. Director of the Smelting Works.
2. See Plattner's Röst Prozesse.
3. This table is computed on 11 months and 9 days only.
4. The difference between this total and that given above is due to piles which were not fully roasted.

TABLE OF LIXIVIATION.

Shells treated	17,667 tons containing copper	209·5 tons.	
Yield : Liquor	7360 cubic meters containing copper	116·3 tons.	
Loss			93·1 tons.
Loss calculated on copper in shells is		44·5 per cent.	
Loss " " " " all ores is.		23·8 "	
Labor 1471 days or 0·07d per ton.			

TABLE OF CEMENTATION.

Charge : Shells	17,667 tons containing copper	209·5 tons.	
Product : Rich liquor	10,086 cubic yards.		
Poor "	2695 " "		
Cement copper, rich	188·7 tons		
" " poor	49·5 " containing copper	116·3 tons.	
Loss			93·2 tons.
Loss therefore			44.5 p. c.
Fuel : Peat	(4·9 per cent. of shells)		·858 tons.
Charcoal	(= 0·023 per cent. of shells)		691 bush.
Iron			320·4 tons.

These amounts give the following as the expense per ton of shells :

Charge : Shells	1 ton containing copper	23·70 pounds.	
Rich liquor	0·57 cubic yards.		
Poor "	0·16 " "		
Cement copper	0.135 tons containing copper	13·16 pounds.	
Loss	(= 44 5 per cent.)		10·5 "
Fuel : Peat	97 pounds (= 4·9 per cent.)		
Charcoal	0·039 bushels.		
Iron	36·23 pounds.		

The expense per ton of pig copper produced is as follows :

Charge : Shells	1519 tons containing copper	3602 pounds.	
Cement copper	2382 pounds " "	2000 "	
Loss	(44·5 per cent.)		1602 "
Fuel : Peat	14,780 pounds.		
Charcoal	6 bushels.		
Iron	5510 pounds.		

THE TREATMENT BY FUSION.

The process consists in fusing the kernels, rich ore and cement copper with sandstone as a flux ; the rich scoria obtained in this and succeeding operations being added for the sake of their copper. The furnace employed is very peculiar, the back and front walls being strongly inclined to the horizon. The furnace is, therefore, in effect, an ordinary shaft, tilted over about 12 degrees from the perpendicular. The object of building it in this way is to make the ore pass slowly through the furnace, the inclination of the back wall increasing the friction ; and also to oblige the gases to follow the front wall and mix with the ore as little as possible in order to avoid too great reducing action. These dispositions have for their object the prevention of iron sows, and the proper preparation of the materials, during their descent, for fusion in the crucible. It is hardly worth while to discuss forms so peculiar, and so little likely at this day, to meet with copyists. But similar constructions have, in times past, been common in Europe, as in the Hartz. They have now been abandoned in most quarters, but it may be well to point out that, with ores rich in iron, sows can be better prevented by a rapid smelting, than by any other means ; and if this rapid fusion does not permit the necessary preparation of the materials in the furnace, they can be prepared before they enter it. This preparation in the furnace consists, according to the Agordo view, partly in driving off the sulphur, and partly in heating the materials. But sulphur can be eliminated to but a very small extent in the shaft furnace. Raw ores, such as the greater part of those smelted at Agordo, practically are, can hardly lose more than 4 per cent. of their sulphur in passing through the furnace, a quantity which could be eliminated by roasting one-twentieth part of the ores before charging. With the Agordo system of building is connected the very serious defect of short campaigns. Eighteen days was the average of the furnaces in 1865. By roasting (if necessary) a part of the ores and smelting 12—15 tons daily instead of 9, and using a straight or a flaring furnace, the campaigns might be trebled in length, and the cost of working reduced.

By reference to the tables further on it will be seen that the expense of fuel per ton of charge is, in the fusion of ore, about 25 bushels per ton, and in that of matte 37 bushels ; the former being 15 and the latter more than 22 per cent. of the charge. This expense would probably be considerably reduced by the adoption of furnaces less wasteful of fuel and capable of maintaining longer campaigns. Even at Lend where the campaigns, for lack of ore, are confined to a week's run, or less, the expense of fuel is no greater.

The following figure (1) represents a section, from front to back, of the furnace used for the fusion of ore.

The resulting matte contains about 24 per cent of copper. It is roasted in piles six times and smelted with sandstone and rich scoria. The furnace is again inclined, but less so than before, as figure 2 shows. It is important, in this operation, to prevent the reduction of too much iron which would make a highly ferriferous black copper. The siliceous flux used at Agordo costs $1.36 a ton, and as it contains about 10 per cent. of iron the amount must be increased over that which would be necessary if the quartz were purer. It is, therefore, an object to smelt with a charge as basic as possible, a treatment which increases the danger of reduced iron.

From this operation black copper of 95 per cent. copper and a richer matte, containing about 60 per cent. copper, are obtained. The former is fined in a

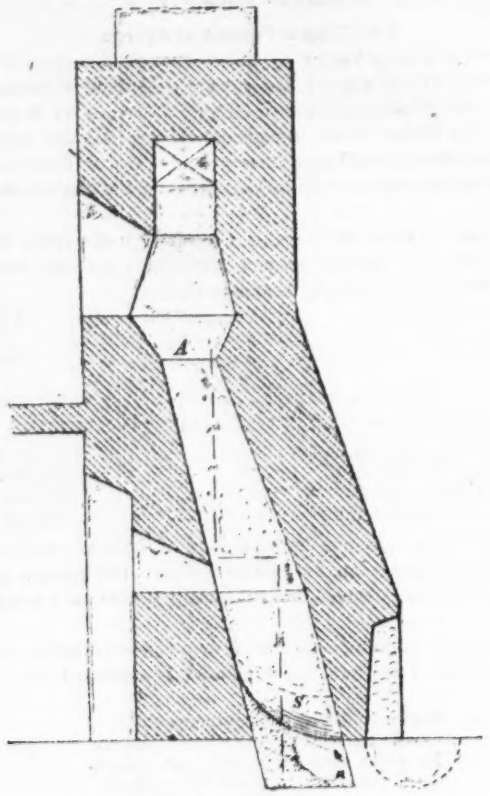

Figure 1.

common German hearth, and the latter is roasted and returned to the same operation.

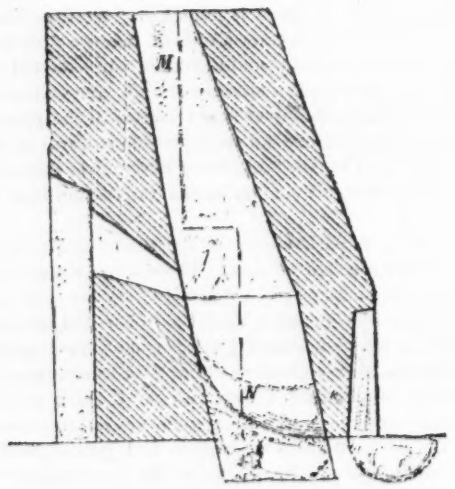

Figure 2.

TABLES OF THE TREATMENT BY FUSION.—FUSION FOR MATTE.

Charge : Best ore containing 7·05 per cent. of copper					447 tons.
Kernels	Best 8·67 " " "				251 "
	Good 6·39 " " "				1752 "
	Poor 3·37 " " "				287 "
Rich cement copper	58·57 " " "				188 "
Poor " "	9·89 " " "				26 "
Crasses & Cinders	34·50 " " "				106 "
Scoria					546 "
Sandstone					579 "
					4182 tons.
Product : Matte containing	23·25 per cent.	copper			1285·0 tons.
Crasses "	10 " "				14·9 "
Cinders "	15 " "				11·3 "
					1311·2 tons.
Labor : 16 campaigns, or 843 shifts of 8 hours each ; 4 men to each shift				33	days.
Fuel : Charcoal 4735 cubic meters				106,310	bushels.
Charge smelted in 24 hours				14·8	tons.
Labor per ton of charge				0·8	days.
Fuel " " "				25·4	bushels.
Loss : The charge contained of copper				642,088	pounds.
The products " "				603,742	"
Loss therefore " "				38,346	"
Or				5·9	per cent.

[TO BE CONTINUED.]

THE COAL TRADE.

NEW YORK, August 23, 1872.

Anthracite Coal.

The state of this trade is such that we can only repeat the stereotyped expressions with regard to "dullness" which have appeared, week after week, for some months past, in the journals more or less interested in recording the coal market. There appears to be no break in the gloom which surrounds the trade; the mirage of higher prices which the sanguine ones report from time to time, comes from a solid advance in prices, as yet so far in the future, as to be beyond our means of exact location. If "old probabilities" were to set his eyes in this direction, possibly he would be able to tell when this foul weather will "clear up;" but, in the meantime, we can only refer to what we have stated for months past; while other journals were prophesying a rapid rise to *come soon*, we have not hesitated to state the facts as deduced from a practical knowledge of this great industry.

The cause of the stagnation of the coal market is not hard to find. The production of our mines exceeds our consumption, and as we export but little, as soon as we accumulate a few hundred thousand tons in our yards, prices go down and down, till the production falls off and allows these stocks to be worked off. We are not of those who believe in a coal export from this country to England for many a year to come, but it is very probable that we could now compete with England in many of the markets where she has, up to the present time, had a monopoly of the trade. And as there is no probability of the prices paid for coal mining in England returning in many years, if ever, to the figures which have enabled her to defy competition, there is a fair prospect that we may now be able to establish a substantial export trade which would act, in a great measure, as a balance wheel or regulator, to equalize prices and prevent a recurrence of these disastrous periodical crises, by absorbing our excess of production. Let some of our enterprising dealers take the matter seriously in hand, look up freights to such markets as England has been supplying—the West Indies, Brazil, Central and South America, &c., and we believe a very important trade can be built up, and one which we will be able to maintain, after the quality and peculiar properties of our Anthracite become known in these markets, even should prices favor England more than they do at present. Our home market proves that even where the difference in price is very considerably against Anthracite and in favor of Bituminous coal, yet for certain industries the former will still be used, so that, if we can once get the use of Anthracite adopted in the markets we refer to, we can count on its continued use even when Bituminous coal can be procured at lower prices. There is no doubt this country must, before long, supply a large foreign consumption, and the present exceedingly low prices may be turned to good account by hastening the advent of that day. English capital, always far-seeing and usually sagacious, contemplates large investments in this country at present. Among other points we may mention the southern portions of the great Alabama coal fields, where it is proposed to mine coal for the supply of extensive iron works and also for the supply of the Gulf trade. It is estimated that at the present time the Alabama bituminous coals shipped from Mobile or Pensacola, could supplant the English coal in the greater part of the West Indies, Brazil and Central America. We will before long call further attention to this point, but at present we need relief in our Anthracite trade, and we would suggest the possibility of securing, through the present low prices, a permanent and profitable outlet for our excess in this direction. The fact that Anthracite stands transportation so much better than the soft coals, that it suffers so much less from exposure to the weather, and the enormous loss (from 10 to 30 per cent.) to bituminous coal where kept in stock for any considerable time, and especially when wet and in a warm climate, makes this consideration much more important than has generally been admitted; combined with less bulk in stowage of Anthracite, and finally its greater calorific power and fitness for special industries, make its preference certain where consumers have once become accustomed to its use.

But what is the prospect for the trade at home? Very dull indeed. Prices are merely nominal, as dealers are selling below quotations, and buyers at the last Scranton sale would now be glad to realize the prices then paid, low as they were. There is consequently an impression prevailing that the next sales will show still lower prices, though not lower than the actual prices at which coal is now selling. The stoppage of a number of collieries in Schuylkill County will have an influence on the market and the cool weather which cannot be postponed much longer will at once stimulate purchases by householders. These causes will undoubtedly infuse new life into the trade here, and will make prices, especially for Stove and Chestnut coal, somewhat better; but there is no prospect of any considerable rise in the market while the yards in every direction are stocked as at present; and the production, *now some four and a half million* tons ahead of last year at this time, keeping up with the consumption. The continued low price of coal, though doubtless pressing very hard on some of our dealers—we hear of some failures among them—is by no means an unmixed evil. It has certainly stimulated consumption; and should the production be maintained with regularity—freedom from strikes or suspensions—the time is not far distant when the natural demand for Anthracite will equal any probable production, for it is estimated that the maximum steady production of our Anthracite fields will never exceed 30,000,000 tons annually, and there is every prospect of the consumption this year exceeding that of last by three million tons. The great corporations now gaining complete control of the Anthracite fields, will certainly reap a permanent benefit from this year of low prices, since it is they who will have to supply the rising market which must before very long set in, and the great increase in consumption will benefit them directly as carriers; in fact it is apparent that this low market is looked upon with favor by some of the large corporations, the president of one of which is reported to have answered with a very emphatic *No* to a recent communication from another corporation, suggesting some concerted action to relieve the present state of the trade. There is also an impression prevailing that the apathy, to say the least, with which these strong corporations regard the low market, is also partly induced by their desire to obtain control of the collieries owned by independent (?) operators, and they are profiting by the financial difficulties of those latterly purchasing mines at very low prices. The price of coal lands (undeveloped) is, however, not affected much by the changes in the market price of coal, for among our most sagacious and enlightened experts, the day is not distant when Anthracite lands will become very valuable and royalties will rule much higher than they do at present. We hear of the Reading R. R. Co., (the Philadelphia and Reading Coal and Iron Co.) forcing matters by seizing the collieries of some of its most important tenants for arrears in rent; this action may precipitate matters with other operators who are sailing "close on the wind" luffing and filling on and off till the squall goes by. We must be excused for borrowing a metaphor from the sea, for in these excessive heats our thoughts and desires naturally turn there.

Anthracite Coal Trade for 1871 and 1872.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending August 10, 1872, compared with the week ending August 19, 1871.

COMPANIES.	1871. WEEK.	1871. TOTAL.	1872. WEEK.	1872. TOTAL.
*Phila & Reading R.R†	136,247	3,138,874	104,038	3,495,487
Schuylkill Canal	29,786	554,141	16,988	502,656
*Lehigh Valley R. R.	64,604	1,178,883	59,548	2,150,136
Lehigh & Sus. R. R.	26,862	685,590	36,605	1,077,446
Lehigh Canal	28,816	302,859	22,947	433,662
Scranton North	20,722	228,732	16,398	438,370
" South	39,632	536,533	41,472	1,348,352
Penn. Coal Co., rail	21,448	325,670	26,315	736,767
" " " canal	....	6,627	120	3,356
Del. & Hud. Canal Co.	35,951	466,648	44,472	820,449
" East	10,369	160,144	8,513	380,426
" " West	3,564	51,58[illegible]	8,967	239,568
" " South	8,692	155,859	8,299	241,267
Shamokin	15,482	402,825	12,430	337,991
Trevorton	....	....	....	....
Lykens Valley Coal Co.	....	54,573	....	2,085
Wyoming North	....	....	....	....
Wyoming South	....	....	....	....
P. N. Y. C. & R. R. Co.	....	104,987	12,350	409,924
Williamstown Co'y	....	....	....	....
Big Lick Col	....	83,259	....	10,591
Total	442,205	8,447,086	412,062	12,619,332
1870	412,062			8,447,086
Increase				4,172,246
Decrease	30,143			

* These figures are for the week and fiscal period commencing Nov. 30.

† Less coal transported for Co's use and Bituminous coal.

Bituminous Coal Trade, 1871 and 1872.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending August 17, 1872, compared with week ending Aug. 19, 1871.

COMPANIES.	1871. Week.	1871. Year.	1872. Week.	1872. Year.
C. & O. Canal	12,851	411,019	18,941	389,454
B. & O. R. R.	24,322	778,397	26,449	771,973
H. & B. T. R. R.	2,812	216,787	6,239	186,364
*Harrisburg & D.	6,188	361,663	9,305	322,644
*L. V. R. R.	8,988	254,801	494	19,499
P. & N.Y.C. & R. Co.	....	.....	7,598	242,412
Cumberl'd Branch Canal	4,113	119 341	5,861	122,922
" " Railroad	1,178	46,951	85	11,599
Total	60,452	2,188,959	73,972	2,062,867
	....	2,082,867	60,452	
Decrease	....	106,092		
Increase			13,520	

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, Aug. 17, 1872.

BY RAILROAD.—ANTHRACITE.

	Tons.	Cwt.
PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.		
From St. Clair	29,252	08
" Port Carbon	5,012	04
" Pottsville	2,789	16
" Schuylkill Haven	19,384	17
" Pine Grove	3,027	10
" Tamaqua	14,335	04
" Harrisburg		
" Dauphin	5,225	05
Total	79,026	04
FOR SHIPMENT BY CANAL.		
Passing Frackville Scales	6,156	05
" Mill Creek "	1,540	17
" Schuylkill Valley Scales	128	06
" Mt. Carbon "	493	03
" Cressona "	6,336	15
" Pine Grove "		
" Tamaqua "	595	18
Total	15,251	04
SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.		
Passing Locust Gap	797	10
" Shamokin	3,656	02
" Herndon	.....	
Total	4,453	12
SHIPPED WEST OR SOUTH FROM PINE GROVE.		
Via Schuylkill & Susquehanna R. R.	756	08
" Lebanon & Pine Grove Branch	598	13
Total	1,354	18
CONSUMED ON LATERALS.		
From Frackville Scales	698	14
" Mill Creek "	444	07
" Schuylkill Valley Scales	640	12
" Mt. Carbon "	709	12
" Cressona "	197	12
" Pine Grove "	54	04
" Tamaqua "	205	00
Total	2,950	01
LEHIGH AND WYOMING COAL.		
Received via Allentown, E. Penn'a Br.	96	17
" " Alburtis, " "		
" " Oreland, G. & N. Br.	638	14
" " Connecting R. R.	.....	
" " Willow Street R. R.	266	17
Total	1,002	08
BITUMINOUS.		
From Harrisburg	9,295	07
" Connecting R. R., G. & N. Br.		
" Junction R. R.	10	00
Total	9,305	07
COAL FOR COMPANY'S USE.		
Anthracite	4,673	16
Bituminous	145	12
Total	4,819	08

RECAPITULATION.

	Total for Week.	Corres'p'g week last year.	Increase and Decrease.
Passing over Main Line and Leh. Val. Branch	79,026 04	96,411 09	d 17,385 05
For Shipment by Canal	15,251 04	27,282 07	d 12,031 03
Shipped Westward via Northern Central R. R.	4,453 12	5,319 17	d 866 05
Shipped West or South from Pine Grove	1,354 18	2,740 12	d 1,385 14
Consumed on Laterals	2,950 01	3,180 06	d 230 05
Lehigh and Wyoming Coal	1,002 08	1,312 14	d 310 06
Total Anthracite paying freig't	104,038 07	136,247 05	d 32,208 18
Bituminous	9,305 07	6,188 09	i 3,116 18
Total of all kinds paying freig't	113,343 14	142,435 14	d 29,092 00
Coal for Company's use	4,819 08	4,076 02	i 743 06
Total Tonnage for Week	118,163 02	146,511 16	d 28,348 14
Previously this year	3893148 06	3505889 02	i 387,279 04
Total to date	4011311 08	3652389 18	i 358,930 10
SHIPPED BY CANAL.			
From Schuylkill Haven	16,389 03	28,063 00	d 11,674 09
" Port Clinton	599 00	2,623 00	d 2,024 00
Total Tonnage per Week	16,988 00	30,6-6 00	d 13,698 00
Previously this year	485,667 05	536,588 18	d 50,871 13
Total to date	502,655 05	567,224 18	d 64,569 13

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending August 17, 1872, with totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt.
Total Wyoming	9,327 16	369,424 15
" Hazleton	41,111 19	1,533,205 15
" Upper Lehigh	77 05	1,719 12
" Beaver Meadow	11,976 05	523,070 10
" Mahanoy	9,004 12	275,514 19
" Mauch Chunk		2,210 19
Total	71,497 17	2,705,143 10
Same time last year	86,211 10	1,437,627 18
Increase		1,267,520 12
Decrease	14,713 13	
Forwarded East from Mauch Chunk by rail	81,547 13	2,150,136 03
Same time last year	64,604 05	1,178,882
Increase		971,253
Decrease	13,056 12	

DISTRIBUTED AS FOLLOWS.

Forwarded East from Mauch Chunk by rail	50,589 11	2,116,021 16
do East for use L. V. R. R.	958 02	34,114 07
Delivered at and above Mauch Chunk for use of L. V. R. R.	1,159 07	41,380 09
To P. & N. Y. R. R.	5,081 16	248,443 17
To N. C. R. R., at Mount Carmel		1,952 05
To D. H. & W. R. R.	663 18	18,322 10
To L. & S. R. R. at Packerton for rail	245 02	9,177 00
Delivered at M'h Chunk	28 03	1,225 16
Delivered on line of road above Mauch Chunk	110 10	11,383 08
To L. & S. R. R., at Penn Hav., for railroad		3,950 07
Do. for canal	8,563 00	139,829 16
To Lehigh Canal Mauch Chunk	2,727 09	71,453 09
To Catawissa Railroad	344 15	7,693 17
Total	71,497 17	2,705,143 10

Penn. and N. Y. R. R.—Coxton, Pa.

Coal tonnage for week ending August 17, 1872.

	Week. Tons.	Cwt.	Total. Tons.	Cwt.
Anthracite received:				
From Lehigh Valley R. R.	6,097	10	248,443	11
" Lack. & B. R. R.	1,717	18	55,872	06
" Pleasant Valley R. R.	3,934	01	69,285	04
" Sul. & Erie R. R.	1,200	08	36,322	11
Total	12,949	17	409,923	12
Distributed:				
To Lehigh Valley R. R.	1,258	12	30,595	02
To Lack. & B. R. R.			1,017	17
To S. Central R. R.	1,560	15	75,538	06
To Ithaca & A. R. R.	1,401	09	69,059	18
To Erie R. W. Pockets for shipm't.	7,491	13	178,921	07
To individuals on line of road	126	17	13,858	01
To points at & above Coxton for use of Co.	569	02	16,861	00
To points between Waverley and Elmira	514	09	24,057	01
Total	12,949	17	409,923	12
Bituminous received from BARCLAY R. R.				
Shipped north from Towanda	7,461	19	240,369	06
Shipped south from Towanda	102	04	1,871	16
Northern Central R R	33	09	170	10
Total	7,597	12	242,411	12
Distributed:				
To Erie Railway	7,226	01	216,690	08
To So. Central R. R.	235	18	23,491	13
To Ithaca Valley R. R.			57	05
Lehigh Valley, R. R.	84	08	1,120	07
To individuals on line of Railroad.	51	05	849	04
To points on line of road for use of Company			205	15
Total	7,597	12	242,411	12
Grand totals transported:				
Anthracite	12,949	17	409,923	12
Bituminous	7,597	12	242,411	12
Total	20,547	09	652,335	04

Delaware and Hudson Canal Company.

The following is a statement of Coal Transported by the Delaware and Hudson Canal Co. for the week ending Aug. 17, 1872.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	44,472	820,249
By Railroad, East	8 513	380,426
" " West	8,967	239,568
" " South	8,299	231,267
Total Tons	70,251	1,671,510

For the same period last year.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	35,951	466.648
By Railroad, East,	10,369	169.144
" " West	3,564	51,582
" " South	8,692	155,485
Total Tons	58,576	842,859
Increase	828,651	

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, August 17, 1872.

	WEEK.	SEASON.
North	48,521 18	1,603.441 11
South	8,298 19	231,266 14
Total 1872	56,820 17	1 834,706 05
Corresponding time in 1871:		
North	53,604 19	663.096 02
South	8,691 10	155,485 03
Total	62,296 09	818,581 04
Increase North		
Decrease North		
Increase South		
Decrease South		
Total increase 1872		1,016,127 01
Total decrease 1872	5,475 12	

Lehigh Coal and Navigation Company,

Report of Coal transported over the Lehigh Canal and L. & S. Div of Central Railroad of New Jersey for the week ending Aug. 17, 1872, and for the year 1872.

	WEEK.	YEAR.
Forwarded East of M'ch Chunk by Rail	36,605 08	1,077,446 01
Delivered at and above do.,	1.014 02	36,152 13
Forwarded East of do., by Canal	22,946 16	433,662 01
	60,566 06	1,547,260 15
Corresponding period last year—		
Forwarded East of M. Chunk by Rail..	26,861 15	685,590 08
Delivered at and above do.,	2,520 13	35,870 06
Forwarded East of do., by Canal	28,845 13	302,859 01
	57,228 01	1,024,319 15
Increase on Railroad	9,237 02	392,138 00
Decrease " "		
Increase on Canal		130,803 00
Decrease " "	5,898 17	
Of the above there was transported on account of—		
Lehigh Coal Nav. Co.	22,816 15	535,349 13
Wilkesbarre Coal & Iron Co.	20.383 00	621,755 18
	43,199 15	1,157,105 11
Corresponding period last year—		
Lehigh Coal & Nav. Co	18,081 11	278,910 19
Wilkesbarre Coal & Iron Co.	15,689 12	516,558 18
	33,771 03	795,469 17
Increase		361,635 14
Decrease	9,428 12	

Shamokin Coal Trade.

For week ending August 17, 1872	12,430 04
Same time last year	15,481 18
Increase	
Decrease	3,051 14
Total amount shipped to date	337.991 00
Same time last year	402.824 18
Increase	
Decrease	64,833 18

Lehigh Canal Coal Trade.

Shipped for the week ending August 16, 1872.

	Week. Tons.	Cwt.	Week. Tons.	Cwt.
Total from Mauch Chunk Region	6,755	13	143,607	16
" " Beaver Meadow "	3,030	14	89,097	15
" " Mahanoy "	288	05	6,903	04
" " Hazleton "	8.563	00	139,363	09
" " Upper Lehigh "	483	06	16,914	06
" " Wyoming "	3,825	18	37,770	11
Total	22,946	16	433 662	01
Corresponding week last year	28,845	13	302,859	01
Increase			130,803	00
Decrease	5,898	17		

Schuylkill Canal.

Report of coal transported over the Schuylkill Canal for the week ending Saturday, August 17, 1872.

	Tons.	Cwt.
From Schuylkill Haven	16,389	00
" Port Clinton	599	09
Total for week	16,988	09
Previously this year	485.667	05
Total	502,655	05
To same time last year	554,141	03

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending August 17, 1872.

	1872. WEEK.	YEAR.	1871. WEEK.	YEAR.
By Railway	26.315 00	736,766 17	21,447 12	325,669 15
" Canal	120 02	3,355 11	....	5,626 14
Total	26,435 02	740,122 08	21,447 12	332,296 09
Increase 1872	407,825 19			

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna, & Western Railroad for the week ending Saturday, August 17, 1872.

	WEEK. Tons.	Cwt.	YEAR. Tons.	Cwt.
Shipped North	16,398	09	439.370	03
Shipped South	41,471	16	1,306,879	15
Total	57,870	05	1,787,721	18
For the Corresponding time last Year:				
Shipped North	20,722	03	228,732	14
Shipped South	39,632	05	536,832	16
Total	60,358	08	765,565	18
Increase			1,022,156	00
Decrease	2,484	03		

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending August 17—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1872., tons ct.	WEEK 1871. tons ct.	YEAR 1872 tons cwt.	YEAR 1871. tons.cwt.
Wyoming Region	34504 13	27143 19	904643 14	715242 01
Upper Lehigh Region	3528 07	4167 01	123922 02	35463 19
Beaver Meadow Region				
Hazleton Region	8682 08	8185 10	146136 08	65729 05
Mahanoy Region				
Tresckow Region	5330 15	2844 13	92283 13	24154 12
Mauch Chunk Region	8415 09	5367 03	273877 19	109265 10
Totals	60471 12	47708 03	1540863 06	950355 07
Increase			590507 19	
Decrease	12763 09			
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	36605 08	26861 15	1077446 01	685590 08
Forwarded East of Mch Chunk by Canal	16787 06	15276 00	279438 01	164045 06
Delivered at and above Mauch Chunk	1014 02	1520 13	36152 13	35870 06
	433 00	539 19	9.04 03	21873 19
L. V. R. R at Packer'n				
Delivered to L. & B. R. R. at Plymouth Bridge	5561 16	3509 16	138622 08	42274 08
Totals				
Of the above there was transported on acc'nt of L. C. & N. Co.	16061 02	8333 06	391741 17	150932 17
W.-B. C. & I. Co.	20383 00	15689 12	621755 18	516558 18
Totals	36444 02	24022 18	1013197 15	667491 15
Increase	12421 04		346006 00	
Decrease				

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday August 17, and during the year 1872, compared with the corresponding period of 1871.

WEEK.

	To C. & O. Canal Tons.	Cwt.	To B. & O. R.R. C. Tons.	Cwt	Total. Tons	Cwt.
1872	18,941	07	25,448	15	44.390	02
1871	12,850	12	24,322	05	37,172	17
Increase	6.090	15	1,126	10	7,217	06
Decrease						

YEAR.

1872	388,453	18	781,973	01	1,170,426	19
1871	411,018	11	778.396	17	1,189,415	08
Increase	....		3,576	04		
Decrease	22,564	13			18,988	09

Cumberland Branch R. R.

WEEK.

	To O. & O. Canal. Tons.	Cwt.	To B. & O. R. R. Co Tons	Cwt.	Total. Tons.	Cwt.
1872	5.860	17	85	02	5.945	19
1871	4,112	11	1,178	09	5,291	00
Increase	1,748	06			654	19
Decrease			1,093	07		

YEAR.

1872	129,922	03	11,598	16	141,520	19
1871	119,341	02	46,950	12	166,291	14
Increase	10,581	01				
Decrease			35,351	16	24,770	15

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

SCHUYLKILL.	AT NEW YORK. August 16. R.	A.	W.	A.	AT PHILADELPHIA. August 16. R. A.	W. A.
Lump	$—		$—		— —	
Steamer	—		—		— —	— —
Broken	—		—		— —	
Egg	5	25	4	75	— —	— —
Stove	5	50	5	00	— —	
Chestnut	4	25	—		— —	
Pea	—		—		— —	— —
LEHIGH.						
Lump, (along side)	5	35	—		— —	— —
Broken	4	60	—		— —	— —
Egg	4	60	—		— —	— —
Stove	4	85	—		— —	— —
Chestnut	4	35	—		— —	— —
Pea	—		—		— —	— —
SPECIAL COALS						
Honey Brook, Le'h	W. A.		4	00@5 00	— —	— —
Spring Mountain	"	"	—	—@—	— —	— —
Sugar Creek	"	"	—	—@—	— —	— —
Sugar Loaf	"	"	—	—@—	— —	— —
Old Compy's	"	"	4	00@5 15	— —	— —
Room Run		"	4	00@4 50	— —	— —
McNeel	"	"		— —	— —	— —
Girardville	"	"		— —	— —	— —
Hill & Harris	"	"		— —	3 10@4 00	— —
Shamokin	"	"		— —	— —	— —
Lykens Valley	"	"		— —	— —	— —
Broad Top	"	"		— —	— —	— —
McMichael	"	"		— —	3 25@4 25	— —
Henry Clay	"	"		— —	— —	— —
Powelton	"			— —	— —	— —

Company Coals.

August, 1872.

	L.	Str.	Ora.	Eg.	Sto	Chest
*Scranton at E. Port	3 60	3 85	3 75	3 85	4 25	3 80
*Pittston at Newburg	3 50	3 50	3 50	3 50	3 70	3 50
*Lackawana at Weehawken	3 50	3 50	3 50	3 70	4 00	3 60
Wilk'b're at Hoboken	3 75	3 75	3 85	3 85	4 25	3 90
Old Co. Lehigh at PtJohn'n	5 25	—	4 50	4 50	4 60	4 00
Lehigh at Eliz. Port	5 00	—	4 25	4 25	4 50	4 00

For freights to different points see "Freights."
To contractors only.

Prices at Baltimore—August, 1872.

Wholesale Prices to Trade

Wilksbarre, by cargo or car load	$4 60@4 85
Pittston and Plymouth, do	4 60
Shamokin Red or White Ash, do	4 75
Lykens Valley Red Ash, do	5 50
Zerba Valley	
Troverton	
By retail, all kinds per ton of 2,240 lbs	6 50@7 50
George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 60@4 65
Fairmont and Clarksburg gas f. o. b. at L. Point	6 00
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein, f. o. b. at Phila	$
Lemon " " "	
Cumberland Vein Coal	
Consolidation Coal Co.'s on board	N. Y.
Maryland Coal Co	"

Prices at Georgetown, D.C., and Alexandria, Va.

August. 1872.

George's Creek and Cumberland f. o. b. for shipping	$4 25@4 35

Prices at Havre de Grace, Md.

August, 1872.

Wilkesbarre and other White Ash for Cargoes	$4 25@4 50
Lykens Valley	@5 50
Shamokin Red or White Ash	4 25@4 50

Bituminous Coals (Cumberland).

Georgetown, F.o.b	$4.25
Baltimore	4.50
New York	6.60

Prices of Gas Coals.

August, 1872.

PROVINCIAL.

Corrected weekly by Louis J. Beiloni, Jr., 41-43 Pine st., N. Y.

	Coarse	Slack.
Block House	$1 60	$— 75
Gowrie	1 60	— 75

Vessels are being chartered at $3 00 to $3 25.

Corrected by Bird, Perkins & Job, 27 South street.

	Coarse.	Culm of Coal,
Pictou	$2 25	1 25
Sydney	2 25	- 80
Lingan	1 60	- 80
Caledonia	1 60	- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty on all slack coal or Culm: 40c. per ton of 28 bushels, 80 pounds to the bushel. On all bituminous coal or shale: 75 cents per ton of 28 bushels.

AMERICAN.

	Currency.
Westmoreland	$7 10 @— —
Fairmount Gas Coal Co. of N. Y.	7 00 @— —
Despard Coal Co	7 00 @— —
Penn	7 10 @— —
Newburg Orrel Gas	— — @— —
West Fairmount Gas Coal	7 00 @— —
AT PHILADELPHIA.	
Westmoreland	6 00 @— —

Prices of Foreign Coals.

August, 1872.

Duty 75 c. per ton.

Corrected weekly by ALFRED PARMELE, No. 32 Pine street, N. Y.

Liverpool Gas Caking	$ 8 00@— —
" " Cannel	12 00@13 00
" House "	19 00@20 00
" Orrel	14 00@16 00
Per ton 2,240 lbs., ex-ship.	
PRICES FROM YARD.	
Liverpool House Orrel, screened	$14 00@16 00
"Cannel, "	19 00@23 00
Per ton 2,000 lbs. delivered.	

Foreign and Provincial Freights.

August 1872.

Foreign.

Newcastle and Ports on Tyne, per keel of 21 1-5 tons £
Liverpool, 5 per cent primage

TO NEW YORK.

Provincial.

Sydney	$3 05
Lingan	3 50
Cow Bay	3 75
Port Caledonia	3 10
Little Glace Bay	3 00
TO BOSTON.	
Sydney	3 00
Lingan	3 00
Cow Bay	3 00
Port Caledonia	3 00
Little Glace Bay	2 90

Freights.—August 16, 1872.

TO EASTERN PORTS.	Cumberland. From Georgetown.	Cumberland. From Baltimore	Anthracite. From Philadel'a.	Anthracite. From Ellis, Port, Port Johnson, and Hoboken.	Anthracite. From Newburgh.	Anthracite. From Rondout...
Amesbury		2 80		1 75	1 95	
Bangor	3 00	2 90				
Bath	2 80	2 75		1 75	1 95	
Boston	2 30	2 30		1 00	1 15	
Bridgeport	2 40			1 40	1 60	
Bristol	2 75					
Cohasset Nar'ows	2 75			1 25	1 45	
Derby	2 50			1 45	1 65	
Dighton				1 75	1 95	
East Cambridge	2 40	2 35		1 40	1 60	
Fall River						
Hackensack	2 85	3 00		1 60	1 75	
Hartford	2 00			50		
Hoboken	2 00			50		
Jersey City						
Lynn				1 30	1 45	
Middletown						
Mystic	2 60	2 75		1 45	1 65	
New Bedford	2 50	2 75		1 90	2 05	
Newburyport	2 85	2 95		1 00	1 15	
New Haven	2 35	2 30		1 20	1 35	
New London	2 35	2 30		1 40	1 60	
Newport	2 40	1 90		50	60	
New York	2 15	1 90		1 00	1 15	
Norwalk	2 50	2 50		1 30	1 45	
Norwich	2 50	2 30		1 50	1 70	
Pawtucket	2 80	2 80		1 70	1 90	
Portland	2 80	2 75		1 90	2 05	
Portsmouth, N. H	2 90	2 90		1 40	1 60	
Providence	2 40	2 40				
Rockport						
Saco						
Sag Harbor	2 85	3 00		1 25	1 40	
Salem	2 75	2 90		1 75	1 95	
Stamford				1 00	1 15	
Stonington				1 30	1 45	
Taunton				1 90	2 05	
Warren				1 40	1 60	
TO RIVER PORTS						
Albany	3 00	2 40				
Catskill						
Cocksackie						
Coeyman's						
Cold Spring	2 30	2 20				
Fishkill						
Haverstraw	2					
Hudson	2 30	2 30				
New York						
Nyack	2 25					
Poughkeepsie	2 30					
Rhinebeck						
Rondout						
Saugerties						
Sing Sing						
Stuyvesant						
Tarrytown						
Troy	3 00	2 50				
West Point						
Yonkers						

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption ($1 85 less 55c drawback	$1 30
For reshipment	1 75

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 66
C. R. R., N. J., Phillipsburgh to Elizabethport	0 98
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$1 99

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 66
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	0 98
Shipping expenses	25
Wharfage	10
Total	$1 99

TO HOBOKEN

L. V. R. R., Mauch Chunk to Phillipsburgh	66
Morris & Essex R. R. Phillipsburgh to Hoboken	0 98
Shipping expenses	25
Wharfage	10
Total	$1 99

TO SOUTH AMBOY.

L. V. R. R.	66
B. & D. R. R. / Cam. & Am R. R.	98
Shipping Expenses	3
Total	$ 199

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	0 7
C. RR. of N. J. Phillipsburgh to Elizabethport	0 98
Shipping expenses	2
Wharfage	10
Total	$2 11

MARKET REVIEW.

NEW YORK, August 22, 1872.

IRON.—There is no change to note in this market. The trade is confined principally to small lots. Importers do not press sales, and consumers only buy for immediate wants in expectation of lower figures. Stocks are gradually growing less, and are being concentrated in few hands, but in absence of any active demand prices are scarcely so strong as for some time past, though by the latest telegrams received, prices are firmly held at the full advanced rates on the other side. The sales are 100 tons Eglinton at $52; 50 do. Gartsherrie, $55 50 cash; 200 do. Clyde, and 100 do. Carnbroe, on private terms. American continues very firm at $53a55 for No. 1; $51a53 for No. 2—the latter price for Lehigh brands—and $48a49 for Gray Forge. For immediate delivery of Lehigh brands higher prices have been offered, but none is to be had. Rails are quiet but firm at $75a76 gold for New; Old are quiet at $51a53 gold for T. and D. H., with sale of 350 tons and 500 do. delivered at a Southern port, both on terms not made public. New American Rails may be quoted $85a90 at the mills. Scrap iron is quiet, $47 50a50 from dock and $52 50a55 from yard, with a sale of 150 tons on private terms; 1,500 tons are also reported sold, but the particulars we could not learn. Refined Bar, Large Rounds, Rods, Band, Horse Shoe, Ovals and Half Ovals, Half Rounds, and Scroll, have advanced $5, and Hoops, $2 50a$5 per ton. See quotations in another column.

PHILADELPHIA, Aug. 19.—(From Circular of Edward Samuel.)—The market remains firm. Consumers are well stocked for some months to come. Closing prices: No. 1 Foundry Pig at furnace, $52a53; No. 2. $49a51; No. 3, Forge, $47a48, and No. 4, White and Mottled, $42 a$44.

LONDON, Aug. 8.—From the monthly circular of S. W. Hopkins & Co.:

EXPORT OF RAILS FROM GREAT BRITAIN.

	Month ending July 31. 1870.	1871.	1872	Seven months. ending July 31. 1870.	1871.	1872.
U. S. tons.	41,495	42,385	41,305	238,540	287,169	300,316
other count's	65,397	45,896	43,258	431,061	277,303	232,289
Total	106,892	88,281	84,563	669,601	564,472	532,605
Old Iron to all Countries	10,528	13,907	12,937	67,927	72,518	68,958
Pig Iron to U States	8,760	11,704	22,645	62,864	104,373	141,823

COPPER.—There has been an active business in Ingot since our last, based on favorable advices from London, where Chili Bar, which had declined recently to £88, and three days later, (19th inst.) advanced to £101. It was rumored yesterday that a still later cable quoted prices a shade off £101, but how much we did not learn. The sales here are said to be about one million pounds at 33¼a33½ cents, cash, and 33½a35 for future delivery. A meeting of Manufacturers was held East last week, but no change in prices was made. 24,000 lbs. old Lead, 20,000 lbs. old Copper, and 16,000 lbs. old Sheathing Copper sold on private terms. A large offering of Spanish Government Copper Cannon was made by auction yesterday, and a small lot sold at 25 cents, the remainder being withdrawn. By auction, 11,000 lbs. old Cannon, etc., sold at 28 cents. cash.

LEAD.—Pig remains dull and unchanged—50 tons Spanish sold at 6¼ cents gold. Bar 9¼ cents, Sheet and Pipe, 11, and Tin-lined Pipe, 16½ less, 10 per cent to the Trade—the last named is an advance of 1½ cents.

SPELTER.—The market is quiet at our quotations. 25 tons Silesian sold at 7 cents gold.

STEEL.—The market is steady and firm at old figures.

TIN.—Pig continues excessively dull, and prices favor buyers—we quote nominally Straits, 34½ cents, English, 24¼, and Banca, 42a44 gold, with sales of 50 pigs Straits on private terms. A cablegram from London received on Monday, quoted Straits, £147 10s. Plates are quiet but firm at previous quotations, with light stocks, especially of ½ X, and I. C. Charcoal Tin. Dealers are busy receiving their purchases, made for delivery this month, but otherwise, there is little moving. The sales of Plates are 750 bxs. Charcoal Tin, at $13 50; 350 do. I. C. Coke, 14 by 20, $12 50 gold, and 500 do. Coke Terne, on private terms.

ZINC.—Mosselmann Sheet is without change—100 casks sold from agents' hands, at 9½ cents, less 4 per cent. gold, less the reduction in duty. Am. Ox. is held at from 8 to 9½; French, 9¼ to 9½; Sheet, 10½ to 11; Manganese, 4 to 4½.

METALS.

NEW YORK, August 22, 1872.

IRON.—Duty: Bars, 1 to 1¼ cents ₩ lb; Railroad, 10 cents ₩100 lbs.; Boiler and Plate, 1½ cents ₩ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₩ lb; Pig, $7 ₩ ton; Polished Sheet, 3 cts. ₩ lb; Galvanized 2½; Scrap Cast, $6; Scrap Wrought, $8 per ton. All less 10 per cent. No Bar Iron to pay a less duty than 35 per cent. ad val.

	Store Prices.
Pig, Scotch—Coltness ₩ ton	56 00@57 —
Gartsherrie	55 50@56 00
Glengarnock	54 00@55 —
Eglinton	52 00@— —
Pig, American, No. 1	53 00@55 00
Pig, American, No. 2	51 00@53 00
Pig, American, Forge	48 00@49 00
Bar Refined, English and American	115 00@120 00
Bar Swedes, assorted sizes, gold	120 00@130 00

	Store Prices, Cash.
Bar, Swedes, 1⅛ to 5 x ⅜ & ⅞ 2 sq. & 6 to 12 x ⅜ & ½	145 00@155 00
Bar, Refined, ¾ to 2 in. rd. & sq. 1 to 6 in. x ⅜ to 1 in.	—@120 00
Bar, Refined, 1¼ to 6 by ¼	125 00@— —
Bar, Refined, 2½ to 2¾ round 1 & 1¼ by ¼ & 5/16	127 50@— —
Large Rounds	127 50@140 00
Scroll	140 00@170 00
Ovals and half-round	140 00@160 00
Band	—@135 00
Horse Shoe	130 00@140 00
Rods, ⅜ to 3-16 inch	125 00@166 00
Hoop	145 00@190 00
Nail rod	@ 9
Sheet, Russia, as to assortment (gold)	17½@ 18
Sheet, Singles, D. and T. Common	—7 @— 8
Sheet, D. and T. Charcoal	—7¼@— 8¼
Sheet, Galv'd, list 10 per cent discount	—@— —
Rails, English (gold), ₩ ton	75 00@ 76 00
Rails, American, at Works in Pennsylvania, currency	85 00@ 90 00

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ₩ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₩ lb	— @— 43
Copper Bolts	— @— 45
Copper Braziers, 16oz. and over	— @— 45
Copper Nails	— @— 45
Copper, Old Sheathing, &c. mixed lots	26 @— 28
Copper, Old, for chemical purposes, 14@16 oz	— @— —
Copper English Pig	— @— 33
Copper, American Ingot	33½@— —
Yellow Metal, New Sheathing & Bronze	— @— 30
Yellow Metal Bolts	— @— 32
Yellow Metal Nails	30 @— 32

LEAD.—Duty: Pig, $2 ₩ 100 lbs.; old Lead, 1½ cents ₩ lb; Pipe and Sheet, 2½ cents ₩ lb.

Galena, ₩ 100 lbs	$— — @— —
Spanish (gold)	— — @6 50
German, do.	— — @6 50
English do.	6 75 @7 12½
Bar (net)	9 25 @— —
Pipe (net)	— — @11 00
Sheet	— — @11 00

Colwell, Shaw & Willard Tin-Lined Lead Pipe 15 cts. ₩ lb.

STEEL.—Duty: Bars and ingots, valued at 7 cents ₩ lb or under, 2½ cents; over 7 cents and not above 11, 3 cents ₩ lb; over 11 cents, 3½ cents ₩ lb, and 10 ₩ cent ad val. (Store prices.

English Cast (2d and 1st quality) ₩ lb		— 16½@— 19½
English Spring (2d and 1st quality)		— 9½@— 10½
English Blister (2d and 1st quality)		— 11½@— 16
English Machinery		— 11½@— 13½
English German (2d and 1st quality)		— 11½@— 12
American Blister "Black Diamond"		— —@— 12
American, Cast, Tool	do.	— 15 @— 16
American, Spring,	do.	— 9 @— 11
American Machinery	do.	— 10 @— 10½
American German,	do.	— 9 @— —

TIN.—Duty: Pig, Bars, and Blocks, 15 ₩ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₩ cent.; Roofing 25. ad val.

	Gold ₩ lb.
Banca	42 @44
Straits	34½@—
English	34½@—

PLATES.

Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ₩ box	$13 50 @13 75	$16 00 @16 25
I.C. Coke	12 50 @13 00	15 00 @15 50
Coke Terne	11 00 @11 25	12 50 @13 50
Charcoal Terne	11 75 @12 25	14 00 @14 50

SPELTER.—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign	(gold) p. 100 lb.	7 00 @ 7 12½
Plates, Domestic	p. lb.	— 8 @— 11

ZINC—Duty: Pig or Block, $1.50 per 100 lb.; Sheet 2½c. per lb

Sheet	per lb.— 10 ½@ 11

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, August 22, 1872.

Our advices from the SanFrancisco Stock Board are dated the 20th inst., without exception the market has declined, compared with our last, the decline is regular and uninterrupted; the report of the Board is as follows:

	Aug. 20.	Aug. 13.
Savage	135	150
Crown Point	139	148
Yellow Jacket	142	147
Kentuck	290	300
Chollar Potosi	81	90
Gould & Curry	175	180
Belcher "New Issue"	120	130
Imperial	13	13½
Hale & Norcross	—	—
Eureka G. V.	—	—

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The dues for the year ending May, 1873, are now payable. All members and Associates who have not paid their dues are requested to do so at once, by sending in postal orders, or checks, or money, ten dollars to the Secretary.

All members and Associates who pay their dues for each current year, strictly in advance, will have sent to their address, regularly and weekly, the ENGINEERING AND MINING JOURNAL, which is the organ of the Institute, and will contain the proceedings and transactions, and all important papers read before the Institute and all notices of meetings. Back numbers cannot, as a general rule, be sent.

II. It is expected that the more important papers read before the Institute, and the debates thereon, will be published in annual or occasional volumes to which those Members and Associates will be entitled who have paid their dues.

III. All authors of papers are requested to notify the Secretary in advance of the meetings, giving the subject and length of their papers. Attention is also called, in this connection, to Rules 12 and 13.

IV. The ninth rule has been amended, so that there will be hereafter three meetings a year, in February, May and October. The meeting next October will be held at Pittsburgh, Pa.

MARTIN CORYELL, Secretary.

Wilkesbarre, Pa.

CIVIL AND MECHANICAL ENGINEERING at the RENSSELAER POLYTECHNIC INSTITUTE, TROY, N. Y. Instruction very practical. Advantages unsurpassed in this country. Graduates obtain excellent positions. Reopens Sept. 11th. For the Annual Register, containing improved Course of Study, and full particulars, address PROF. CHARLES DROWNE, Director. June-23-6t.

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DEPARTMENT OF POPULAR SCIENCE.

Re-Building Chicago.

CHICAGO, July 24, 1872.

The mournful interest which attended, last winter, an inspection of the "Burnt District," has given way to an attraction far more pleasant, and scarcely less profound. The charm of intense and cheerful activity now pervades the scene. The amount of building now going on is amazing. More than five miles of store-fronts are rising together from the ruins of old Chicago, to give fair promise of the new Chicago that grows speedily to be an accomplished fact. Fourteen new hotels are under way, and many large and handsome buildings are well advanced towards completion. As a general rule, the new buildings erecting for business purposes are both substantial and tasteful. I see many iron pillars, but few iron fronts.

Meanwhile the business of the city is accomodated temporarily in all sorts of ways. On some streets, whole blocks of dwellings have been converted into stores and offices. A few of the new buildings in the burnt district have been occupied; but a good many stand complete and empty, placarded, "To Let." Those speculators who rushed in last fall and put up new blocks at any cost, expecting to rent them at enormous figures as soon as they were completed, seem to have been disappointed, Their mistake is plain enough now. Business cannot return to its old haunts until they are accessible. The stores first finished stand in the midst of acres of rubbish, bricks, mortar, stone and lumber, which encumber the streets, obliterate the sidewalks, and render all travel a slow and dusty pilgrimage. This is unfavorable to all trade, and fatal to the retail trade; and hence these locations are not at present desirable, particularly in view of the fact that the rents charged are foolishly high. So the merchants wait for landlords to grow meeker, and streets cleaner, and for the currents of business to return into their old channels.

But will these currents ever return? This important question may be confidently answered in the affirmative, on several grounds, which are interesting and instructive enough to merit a brief mention.

Immediately after the great fire of last October, powerful intrigues were set on foot to change, if possible, the city's center of business. But these movements counteracted one another, and thus defeated any prospect of a radical change. The Board of Trade determined to re-build on its old site; and its magnificent edifice, a duplicate of the one destroyed (only in darker stone) is already nearly finished. Other large commercial institutions followed suit; and so the question as to financial headquarters was settled.

The business part of the city was perhaps as well located as it could have been. The deficiency was not in its position, but in the shabbiness and dangerous combustibility of a quarter of the city immediately adjoining. That has been cleaned out entirely by the fire and is to be rebuilt with substantial stores. A part of the district formerly devoted to residences, and devastated by the fire, will also be occupied for commercial purposes.

Field, Leiter & Co., the heaviest Chicago house in foreign and domestic dry goods, will occupy, as soon as it is finished, a magnificent building in the heart of the burnt district, but outside of the old business district, and where the shanties used to be. It is believed that Farwell, their great competitor, will go into the same neighborhood; and, if so, the fashionable trade, large and small will soon follow.

As a general rule, the Chicago merchants are preparing to occupy larger room than formerly. The business district, as now planned, will occupy all the old ground, and nearly twice as much more. A large increase of trade is expected, but doubtless the whole of this large space will not be filled, though many new houses are commencing business. There will be gaps in the commercial streets for a while; but this will be a real advantage to the city, in giving it a chance to grow without whimsical changes of plan. Practically, commercial Chicago has staked out its limits for the next ten years, and domestic Chicago can sit down in quiet and peace, without fear of being immediately elbowed by trade out of its cozy homes.

Money has been plenty here since the fire. That was not only a loud call upon the generosity of the world, but a huge advertisement to capital. A vast amount of capital has come hither to partake in the profits of the new era. I am told that $30,000,000 of money to be expended in buildings, now lies in the Chicago banks. The population of the city is larger than it was a year ago; and the "back-country," upon which the wealth of the city surely rests, is "there yet," richer and more productive than ever.

The truth is, there never before was a great disaster, so large a proportion of the effects of which were distributed upon others than the apparent immediate sufferers. The large losses of insurance companies, and of other institutions and private capitalists holding Chicago mortgages, have sensibly mitigated the injury done to this city; and the tremendous energy of her own citizens in repairing and maintaining all the machinery of a vast trade with the interior, is doing the rest. If St. Louis had any opportunity to snatch the laurels from Chicago, it is gone now.

The wisdom, skill and integrity with which the Chicago Relief Committee administered its great organized charity, has been commented upon in your columns already. Their operations were so beautifully adapted to the end in view that they succeeded in preventing starvation, pestilence and distress, and yet they created no paupers. I have been looking for the temporary houses and barracks of which so much was said in the papers. They are gone—at least as a prominent feature of the present appearance of the city. On the first of May, everybody was set to swim for himself, and the Committee had still a million dollars or so, to be employed in loans of tools, etc., to respectable mechanics and small tradesmen—and finally to be turned over to the ordinary works and channels of charity.

R. W. R. in *Christian Union*.

Steam on Canals.

It is well known to our readers that the State of New York has offered a large reward to the inventor who shall establish a system of steam towage on canals, which shall be practically and successfully applicable to the canals of that State as they now exist. A number of inventors have presented plans, and probably no other competition was ever entered into with equal spirit by inventors. Some preliminaries concerning the nature of the trials had to be determined, and the Canal Commissioners accordingly heard arguments from various competitors, and adopted the following rules:

"Whereas, it is the opinion of the Commission that the intent of the law in regard to the speed required of competing boats is that the same shall be determined by the rate of movement through the levels of the canal, not including lockages or the navigation of the Hudson River, and that the objects of the preliminary tests required will be secured by not requiring over one hundred tons of cargo to be carried west; therefore, it is

Resolved, That the first and second resolutions, adopted by this Board July 10, 1871, relating to preliminary tests, which were as follows:

"Resolved, That for the purpose of carrying out the intent of the law, this Commission will require, among the tests to be made, that the several competitors shall make not less than three round trips from New York and Buffalo or Oswego; each boat to be loaded with not less than two hundred tons of cargo each way; the trips to be commenced as soon as any party is ready, and all completed in the least practicable time. For the purpose of determining the time consumed by each and all the trips, the clearance must show the day of the month and time of day that the boat passes each collector's office; certified copies thereof to be furnished to the Commission. In order to obtain information in regard to the practical working of the several devices in competition, as soon as practicable, the engineer of the Commission, Mr. David M. Greene, of Troy, will inspect the same from time to time, as in his judgment may be necessary, and report the facts obtained to this Commission.

"Resolved, That competitors are hereby notified that for the purpose of carrying out the intent of the law, though it is desirable that the three consecutive round trips from Buffalo or Oswego to New York be made at the earliest time practicable, the whole of the year 1872 will be allowed to such persons as may desire so much time, and the awards will not be made until the close of navigation in that year,"—be and the same are hereby modified by the passage of the following resolution:

Resolved, That boats making the three round trips from Buffalo or Oswego to the Hudson River and return, as heretofore required by this Commission for the purpose of determining the rate of speed of said boats, will not be required to continue the trips to New York city, nor to carry more than one hundred tons of cargo going west, and that deductions from the time consumed in navigating the canals will be made for passing the locks, equal to twenty hours for each round trip from Buffalo, and proportional allowance will be made if the trial is from Oswego. In case of delays growing out of obstructions to navigation that are caused by breaks in the canals or injuries to the structures, or sunken boats, or such as detain boats drawn by horses, the time lost will also be allowed for in computing speed.

The Commission adjourned to meet at the office of the Canal Commissioners in the city of Syracuse, Tuesday, October 1st, 1872, at three o'clock, P.M.

American Coal for England.

A few weeks ago we jokingly suggested that England offered a market where the enormous excess of our coal production this year could be worked off. The fact is, freights present an obstacle that is perhaps insurmountable. But we notice that the distress in England has led to a similar suggestion, earnestly made, by a Truro correspondent of the *Mining Journal*, whose letter we print for the amusement of our readers:

SIR—We are threatened (at least) with coal to rise to £3 per ton during the coming winter months in London. Welsh coal is to cost householders this price, if not more. Now, what we require in our houses, is a coal which will cook the dinner, and give some warmth. I speak of the masses generally. In Pennsylvania and other States of America we hear of unlimited coal fields as large as the area of England herself, and, I believe, recently discovered. Nothing prevents our active-minded, enterprising cousins from importing Coolie labor into the coal districts in question to work the vast mines. The cost of labor will be nominal. I have visited the far east and west myself, and am pretty well acquainted with the labor markets. It has been stated that this coal can be landed in England at from 13s. to 15s. per ton net. These abominable strikes would thus receive a salutary check, and bring a just retribution on the extortioners themselves.

The best coal would only be required by steam-engines, railways, and steam-vessels—the two latter must raise their fares for a time; but less coal will be required, and the men caught in their own net. Undoubtedly inferior coal in the parlor is objectionable, and chokes the grate with dust. Perhaps, however, some of your enlightened readers can tell us more about this American coal and its merits. Some have praised it. The matter, however, needs immediate consideration, and public attention. Americans may peruse this letter, and see an immediate fortune at hand. I hope so for our sake, especially for the poor in our great cities H. P. B.

The story that England is importing Belgium coal turns out to be true. Our foreign exchanges contain the following item: "The Grimsby Steamship Company are now bringing coal from Belgium to the port of Grimsby, for the use of the Manchester, Sheffield and Lincolnshire Railway Company. The sample appears of good quality, but not so hard as the Yorkshire coal. It is used in Belgium for locomotives, as is also the Briquettes, or 'patent fuel,' of which a cargo is expected by one of the above-named steamers from Ghent."

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
JOHN A. CHURCH, E. M. Editors.

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THE coming Vienna Exhibition seems to rival that of Paris, if not to exceed it, in the interest it arouses in every country, except our own. In France they propose to neglect the English Exhibition, which takes place at the same time, and the funds which were voted for it, are to be given to strengthening the French side of its Vienna competitor. As to the share this country will probably have in that great assemblage of industrial objects, it is melancholy to be forced to acknowledge that the *Journal of Applied Chemistry* is correct when it says: "We suppose that a few American flags, a stuffed eagle, and a counter for the sale of soda water, will be all that our country can boast of in the instructive race at Vienna, unless private enterprise and the indulgence of the Austrian authorities can provide a remedy. The time for the entry of certain classes of goods has long since passed, and it can only be by special forbearance that our manufacturers can recover lost ground. In the meantime, we understand that some of our manufacturers and inventors have made arrangements with English houses to have their goods exhibited in the section devoted to Great Britain."

The conduct of Congress is an insult to Austria, and a saddening proof of the difficulties under which industry and science labor in this country.

Governor Woods and His Secretary.

We have received satisfactory evidence that Mr. GEORGE A. BLACK, Secretary of the Territory of Utah, was not a party to the arrangement by which his signature and official seal were promised to the reports of a mining bureau in Salt Lake City. Mr. BLACK was absent from the Territory when the disgraceful letter of Governor WOODS was written, and took the earliest occasion, after learning the fact, to disavow all connection with the scheme. We very cheerfully withdraw our criticism upon the part which we supposed he had played in the matter, and beg our readers to take the strong adjectives we applied to the Territorial Secretary, and lay them on the head of the Governor, who now deserves all that, and more.

We have pointed out in a former article, that to act as director of a Mining Bureau, and counsel for the opponents of its clients, is not compatible with the dignity or the duties of a Governor. Indeed, the spectacle of a Governor practising in the courts at all is open to grave objections. We now venture to add that the use of another gentleman's name without his permission, and particularly in such a way as to render that other gentleman, until the mistake is explained, more or less infamous, is quite improper for a Governor, and not the cleanest kind of business even for a private citizen.

Governor WOODS has made a sudden visit to Washington, doubtless for the purpose of explaining matters. As he has returned to Utah, with his official head on his shoulders, it may be inferred that he has explained them, for the present. It is rumored that he denies the authorship of the letter published in the London *Times*, over his name. But he has taken care thus far not to make that denial publicly. He has had time to do it; and he must be aware that mere private excuses in Washington or on the streets of Salt Lake City do not remove the disgrace which his publicly uncontradicted letter has inflicted upon the administration and the country. But whatever he may choose to do about it, it is too late for him to redeem himself officially. He may prove that he is not too guilty, but it will be by showing that he is too innocent, to be fit for a Governor. If Utah is full of naughty, naughty people, who write letters and sign other folks' names to them, then Utah should have a Governor of enormous physical and moral courage, a giant of free speech—a man, in short, who, when such an outrage has been perpetrated, will boldly say, in about six weeks at least, that he disapproves of it. There are a few such men left in this degenerate age. If they don't run mining schemes and private law practice too, we must put up with those deficiencies. We can't have everything in a Governor.

The Appointment of Mining Officers.

The principle of examinations is a good one. No objection whatever can be raised to the appointment of a man who upon careful inquiry is proved to be better fitted for a particular task than all others who present themselves as his competitors. But against the *practice* of examinations for appointment there is a great deal of sound and sensible objection brought forward. No one has yet discovered how to make examinations fair, telling and really indicative of the candidate's mental powers and business experience. The civil service examinations of every country are a standing subject for joke with the literary buffoons of the day. They are properly so, for the questions put, such as the distance of the sun, the size of the moon and the like, are often absurd. A correct answer does not prove that the candidate is well informed, and an incorrect one should give no reason whatever for suspecting that his aptitude for the conduct of business is inferior.

When examinations come to deal with such a subject as the appointment of inspectors and managers of mines, men who must add the faculty of fair criticism or executive ability to an intimate and varied experience of mining work, the question presents increased difficulty. Shall we take the practical man, familiar with the work *as it is carried on*, or shall we take the scientific man who knows *how it ought to be* carried on? To combine the two in one person, is a matter of such difficulty, especially at the rates of pay governments are willing to allow, that it is almost out of the question.

The dealings of a government with the masters of an industry which requires supervision, are usually carried on upon the basis of a compromise, the government claiming the right to secure the safety of human life at any cost to the masters, the latter holding that business must be carried on and that restrictions should not be oppressive. In the matter of mine inspection, a labor to which it is impossible to bring too accurate a knowledge of theory, or too much practical experience, it seems to us that, on the whole, it is better to compromise in favor of the masters' views. The head of such an inspection should be a man well informed in science, the inspectors should be practical men, and requirements imposed on the masters should be such as will not interfere with their business. Lay out as sensible a scheme as possible, and trust the further improvement of the scheme to the criticism of events. Such a course is as safe as any other, and it has the advantage of recommending itself to master and miner alike, who see their interests committed to practical men of their own class, and similar in experience to themselves.

Considered in this light we look upon the method of selecting examiners, proposed by the new English law, as a good one. The Home Secretary is to nominate three owners, three miners and three engineers, and this board, in conjunction with the inspector of the district, is to select examiners, who will inquire into the fitness of the managers of mines; for it is intended to suffer none but *certified* managers, men whose knowledge is vouched for by their most competent neighbors, to take the important charge of a mine. They are to be classed with engineers who must have certificates of competence. As a means of ascertaining what the ability of a manager really is, the method proposed seems to promise as good results as any that could be devised. All the classes interested in mining have a part in the selection of examiners, and looking at the composition of the board we should say that any person they declare to be fit for the work, will certainly have practical experience of mines, and probably some knowledge of the conclusions of scientific writers.

Engineering Schemes in New York.

Among the projects for the improvement of transit in the city of New York, an improvement sorely needed and long delayed, is a tunnel under Harlem River, and a suspension bridge over it. The necessity of a tunnel cannot be too greatly exaggerated, and it will probably not be many years before the railroads leading North and East will leave the island under water instead of over it. It was reported that a navigation company proposed, this present summer, to run boats every ten minutes through the Harlem River, an arrangement which would have produced the most annoying consequences to travellers by the rail. That scheme, if it were really proposed, was not carried out. But rivers are the highways for boats; bridges are obstructions and, in case of such frequent passage of boats, the railway would be exceedingly inconvenienced. A tunnel is the only remedy on land so near the water level as that over which the tracks run in New York. The difficulties with a river, so shallow as Harlem River, are not great and as we said, this bids fair to be the ultimate solution of the question.

The daily papers have given some details of th

proposed bridge and tunnel which we reprint. The work is to be done under the direction of the Park Commissioners, and is a public and not a private undertaking. The structures are to form part of the road system designed to accommodate the great and increasing travel by private conveyance between Manhattan Island and the main land.

The tunnel, according to plans prepared by direction of the Commissioners, is to be built of solid masonry, extending 1,663 feet on the New York side and 1,078 feet on the Westchester side of the river. It is designed to have the top of the arch so far below high water mark that vessels drawing seventeen feet of water can pass over it in safety at high tide. At low tide vessels drawing less than thirteen feet can safely pass over it. The tunnel will be about 2,759 feet long, 16 feet in height and 34 feet in width, thus affording twenty feet of wheeling space and seven feet on each side for foot passengers. The descent will begin at One Hundred and Fiftieth street, and the top of the tunnel will strike the water bed at One Hundred and Fifty-fifth street, at a point about two hundred feet south of the present Macomb's Dam bridge. The entire cost of the work is estimated at about $1,500,000.

We do not know what means will be adopted to drive the tunnel, but presume that the practice found so convenient in Chicago will be adopted. In that city a coffer dam is carried half way across the river, the tunnel site is dug out, and the brick work then built, the whole process being an open air one. When one half is finished the other half is constructed. In this way travel is uninterrupted, the work can be done in the most thorough manner, and at the least cost.

The Suspension bridge, the construction of which was authorized by an act of the legislature in 1871, is designed to be about 1,800 feet in length, of which 734 feet will be within the jurisdiction of New York, and 1,066½ feet in Westchester County. The roadway will be about one hundred and fifty-three feet above high water level, and extend from Tenth Avenue to the heights on the opposite shore, west of the Croton Aqueduct. It will be twenty-three feet higher than the present High Bridge.

We have little desire to say anything good of the infamous ring which so long ruled and plundered New York, but it is undeniable that during the time of its supremacy a better class of city engineering came into vogue and will doubtless outlast the power which brought it into being. Our streets are now laid with some reference to stability and sound engineering principles. Our public works, enormously costly, it is true, are nevertheless directed with better taste and conceived in a more liberal spirit than ever before. New York can afford to pay for anything whatever, that beautifies and really improves its streets and squares and the economy of its internal system. Its citizens know that the opportunity of a city is always the present moment, and had the vast sums spent by the ring been honestly spent, there would have been no complaint.

Wooden Pavements.

Chicago possesses sixty miles of wooden pavement, and as this kind of road lasts ten years it has six miles to repair every year. The repairs are mostly confined to the center, the side blocks remaining intact. Some of the streets are 66 feet wide, with 16 feet off for sidewalk; others are 80 feet, with 18 feet sidewalks and others 100 feet with 20 feet sidewalks. Taking the average width of roadway at 44 feet, we have 1,548,840 square yards of wood pavement in Chicago. If two-thirds of ten miles of roadway has to be repaired after ten years, we have 172,094 square yards renewed every year, without making allowance for the ultimate renewing of the remaining third. With a thickness of 6 inches this gives about ten million feet of lumber destroyed every year.

Such a pavement, with such a destruction of material may answer for Chicago as long as the vast forests of Michigan remain. But there will come a day when this priceless treasure will be exhausted, and Chicago must turn to some other resource. Wood makes a delightful pavement to drive on. Those who have seen only the wretched attempts at wood pavement which are imposed upon New York, must not judge Chicago by them. It is not too much to say that no city in the world surpasses, in excellence of pavement, that city of wonderful growth and great promise, which rests on the shore of Lake Michigan. The streets of Paris itself are no smoother, and in a rain storm are far more slippery and disagreeable. Wooden pavements are likely to brave the future with all success in Chicago, until the exhaustion of forests raises prices of lumber in that city from $10 and $20 a thousand to rates s mething like those that rule in older cities.

It is partly this cheapness of material, especially of the poorer sort, suitable for road-making, which makes this pavement profitable in Chicago. What price the city pays we do not know, but private contracts can be made for about $2.50 a yard. In New York, we believe, the price of the blocks alone is $5 a square yard, and the cost of laying is extra. The work is wretchedly done, and the pavement, which ought to be the most satisfactory of all to the people, is the least so.

A peculiar question arose in connection with the building of the Peabody Houses for the Poor, in London. The trustees of Mr. Peabody's fund are building six blocks of residences in Bermondsey, to be known as the Peabody Industrial Dwellings. Finding that houses of the required character could be built more cheaply in concrete than in brick or stone, the trustees adopted that material. The Board of Works brought action against the trustees for violating the rule which prescribes that "every building must be built in brick, stone, or other incombustible material, properly *bonded* together."

A concrete wall cannot be bonded, but is laid up in one solid piece from foundation to top. The justice before whom the case was brought, joined the Board, the trustees, and the lawyer in making a thorough inspection of the building, and came to the conclusion that while the building was technically outside the rules, yet the general tenor of the evidence was in favor of the sufficiency of the principle of building adopted. In this decision he was manifestly correct. It has been often decided that the law, whatever the words of its restrictions may be, has no intention of preventing the introduction of new processes or discoveries, which fulfil the purpose of the act without being in exact accordance with its words. If concrete does not require any bonding at all, it is evidently *sufficiently* bonded; that is, its properties answers the purpose of bonding in bricks, and the law has no intention but that of securing workmanship of sufficient strength.

A company has been formed in San Francisco to raise the rich gold sands of the sea coast and work them. Nature has already "dressed" the ore, and the sea bottom is said to consist chiefly of the iron sand which is always one of the products of treating alluvial deposits in California. It is natural to suppose that such dressed material would be very rich and such is the lesson of experience, though we believe the value of the sand is very variable. The method proposed for obtaining the auriferous material does not strike us as very good. It is intended to work with a diving bell and raise the sand by means of a vacuum pump. Why not do without the bell? It would be quite possible to make the pump do all the work, and a steam dredge, in which a rotary pump, with its tubes extending down through the water into the bottom, does the work of excavation as well as raising, has been constructed for a similar work in England. Its principle is the right one and its work should be enormous. The San Francisco company, intend, it is said, to raise 100 tons an hour, but to do that by manual labor, under water, will be expensive.

EDITORIAL CORRESPONDENCE.

Colorado, Over the Range.

FAIRPLAY, Colorado, Aug. 5, 1872.

Fairplay is the county-seat of Park County, and is situated at the head of the South Park, in the shadow of Silverheels mountain. The town is not much to look at—one main street, lined with houses of various pretensions, from the humble log to the stately clapboard; but none of them large or handsome. The bed of the Platte, on the high bank of which the town is built, is scarred with the traces of bank and bar mining for gold. Even now, there is much good ground left for such purposes; and activity in that line has not ceased, though it is confined to fewer hands than formerly. The present proprietors of claims own large amounts of ground, bring water in ditches and flumesf or ground-sluicing, "booming," or "hydraulicking," and employ numerous workmen. Among the successful operations in the neighborhood of Fairplay are those of Mr. MILLS and Mr. VAN CLEFT, who employ from 800 to 1000 inches of water daily, and get, I believe, $8 or thereabouts to the hand per day. A larger enterprise is that of Mr. CLARK, who is putting into the Platte a bed-rock flume, over two miles in length. It is expected to strike the bed-rock some distance below the town. Undertakings of this character have been common enough for years in California; but they are comparatively new in Colorado. In fact, they cannot well be brought to pass until the "flush times" of placer and gulch mining are over; and the reaction permits the consolidation of claims, affording a suitable basis for the investment of capital in thorough preparations. "Booming," above alluded to, is a device by which a small supply of water is made to do more work in tearing down the clay and gravel. It consists essentially in accumulating the water in reservoirs, and letting it out at intervals with a rush. The same thing has been occasionally tried as a means of discovering lodes where the side of a mountain is covered with earth and debris. A ditch (called a boom-ditch or bum-ditch) is carried along the mountain-side, and the rock below is stripped with the aid of the water. I regret to say that, like all other wholesale methods of discovering veins, "bumming" has given, so far as I know, but little satisfaction. Patience and the pick still remain the prospector's best outfit.

Fairplay is more than usually lively to-day, since it is the annual occasion for the session of the county court. The lawyers have come to town; and knots of clients are gathered in the street, cheating the lawyers by arguing and compromising their own cases beforehand. Criminal business there is little or none. The judge told me yesterday that there had never been, to his knowledge, a serious crime committed in the county, except such acts of violence in earlier days, on the part of outlaws, as the people followed, then and there, with swift and conclusive punishment. To-day the first grand jury has been summoned; and it may be anticipated that hereafter both criminal and civil practice will be a little livelier; for Fairplay is getting ready for a "quartz excitement," and though I do not anticipate a heavy influx, either of population or of capital, I think a movement is beginning which will not again utterly die out. The newest discoveries in the neighborhood, while they do not yet amount to a solid basis for regular industry, will stimulate the revival of other mines, long known, and feebly or unsuccessfully worked, but destined nevertheless to be reasonably profitable.

The recent developments to which I allude are upon Mt. Bross and Mt. Lincoln. They have been already mentioned and described in the ENGINEERING AND MINING JOURNAL; and I shall not enter upon a detailed description of them here. Suffice it to say that they consist of deposits of very rich argentiferous ores in a limestone which overlies the granite and is in turn apparently overlaid at the summits by porphyry. None of the mines is opened sufficiently

to determine its character and extent. The Moose, on Mt. Bross, is the most extensively exposed, having been exposed longitudinally along the outcrop for nearly 250 feet, and found at intervals by prospecting pits for some distance further at each end, giving a total length between the extreme workings of 400 to 450 feet. It appears to follow the stratification of the country rock, dipping at this point not more than 15 degrees in a southeast direction. The average thickness of the ore throughout the 250 feet exposed is about 18 inches, the maximum being 2½ feet, and the minimum next to nothing (a mere seam, where the deposit appears to have pinched out for about fifteen feet). The ore contains malachite, azurite, copper pyrites, galena, carbonate of lead, and sulphurets of silver. In other words, it is highly decomposed, as might be expected from its position, at an altitude of over 14,000 feet, far above timber-line, in rocks cracked through and through with frost, and carrying ice in their pores and interstices the year round. Both the ore and the hanging wall are much affected by frost. The latter will not stand without strong supports; and in fact has thus far been removed entirely—a method which will not be practicable when work goes deeper into the mountain. Transportation is carried on with donkeys, of which sixteen, making two trips a day, bring down about two tons of ore, and carry up the necessary supplies. The men live in cabins, half buried in the rocks, to escape the force of the winds and the driving snow. The mine is to be opened with a shaft, and the shaft-house and blacksmith's shop will be sunk so as to bring the roof level with the side of the mountain, over which the snow sweeps, leaving it bare, and accumulating in immense banks and drifts in the gullies. A great deal of snow still remains on the mountain, but there is none at the mine.

The Baker, Silver Star and other mines on Mount Bross, have produced rich ore in small quantities, but are not extensively developed. The Dwight, a still older location, has been considerably excavated, but yields ore of lower grade. It belongs to the owners of the Moose, lies lower down the mountain, on the other side of the ridge or spur, and may possibly be connected with the Moose, which Captain PLUMMER discovered while working the Dwight.

Mt. Lincoln is a little higher than Mt. Bross; but the mines are not so near the summit. The Lincoln, belonging to the Lincoln Co., is the most important at present; but, though it has produced rich ore, it is not in a condition to show a regular and continuous deposit. The ore has thus far occurred in small pockets, with intervening threads and seams. The difficulty of tracing and defining the deposits on both mountains has led to the location of many conflicting claims. A company of Colorado gentlemen, called the Park Pool Association, has made many locations, including tunnel sites, and even, if rumor is correct, square surface locations under the placer law. If their claims hold good, they will control almost all the mining ground, except a very few of the oldest locations. This application of the "tunnel clause" in the new mining law, so as to stop prospecting on the surface, is regarded with great indignation by the miners generally. But I will not now discuss that subject. My opinion about it is well-known, and was pronounced when the press and people of Colorado took the other side, with much vivacity. There will be new views on the tunnel question in Colorado henceforward.

Mr. E. D. PETERS, Jr., is erecting smelting works about six miles from Fairplay, on the road to the mines, and about ten miles from Quartzville, the mining settlement which has grown up just below timber line at the base of the two peaks. Mr. PETERS will treat the rich ores by mixing with galena, of which an abundant supply is said to be available, and smelting in a shaft-furnace. Professor HILL also has talked of erecting works; but he has not yet commenced; and I presume he will wait until the production is better assured. Meanwhile, Professor HILL purposes to buy ores, at such prices as will prevent shipments out of the Territory; and if this policy is followed successfully, he will have no competitor at present except Mr. PETERS. The galena and copper mines of Mosquito, Buckskin and Horseshoe districts will now have a market; and in the development of these districts, as well as the increased activity of prospecting all around them, lies the hope of a growing prosperity for the mines of the South Park.

R. W. R.

About-Town Jottings.

BUSINESS AND PERSONAL.

Personal announcements and business notices inserted at fifty cents per line.

Root's Wrought Iron Sectional Boiler, manufactured by the Root Steam Engine Co., 500 to 510 Second Avenue, New York.

Utica Steam Engine Co. (formerly Wood & Mann Steam Engine Co.,) 42 Cortlandt street, N. Y.

Post & Goddard have removed to No. 111 Liberty street. Dealers in Taps, Dies, Reamers, Drills and supplies generally.

American Submerged Pump. Power attachment—cheapest and best in the market, 55 Chambers street, N. Y.

Roper Caloric or Hot Air Engine, 124 Chambers St.

Blake Bros., New Haven, Conn., manufacture Stone Breakers for crushing ores and minerals of every kind into small fragments, preparatory to their further comminution by other machinery.

The Niagara Steam Pump Works, 23 Adams street, Brooklyn, N. Y., are now working to their fullest capacity.

Launch of the Steamship Pennsylvania.

On Thursday, August 15, at the ship yard of Messrs. CRAMP & SON, Kensington, the new steamship Pennsylvania glided gently into the Delaware and settled gracefully into what may be called her *native* element. The cheering of tens of thousands of voices, the roaring of cannon, the strains of music, and the deafening clamor of steam whistles applauded the successful launching of the largest American iron steamship. It is a proper subject for national pride that an American company, with our own money, by the hands of our own skilled workmen, using our own materials, can build so superb a vessel as this. Very properly the christening was done by an attractive American girl, by breaking a bottle of American wine. The Pennsylvania is one of four vessels contracted for; the other three, named, respectively, the Ohio, Indiana and Illinois, being now on the stocks and rapidly approaching completion. As they are all built from one model, the following brief description of the Pennsylvania applies to them all. She has a length over all of 355 feet, a beam of 45 feet, and a depth of 43 feet, with a capacity of 3,016 tons. She is built entirely of Pennsylvania iron, except that used in the boilers which comes from Baltimore. She will have 24 state rooms for first-class passengers and accommodations for about 800 steerage passengers. Her engines, which go by the imposing title of independent-compound, vertical, direct-acting, surface-condensing, propeller engines, are made according to a new invention, using the steam twice, once in a high-pressure cylinder, and then in a low-pressure cylinder into which it is passed. It is claimed that these engines will effect a great saving. Her average speed is to be 11½ knots an hour, and her consumption of coal not to exceed 40 tons in 24 hours.

At last the long-talked of steamship line between Philadelphia and Liverpool is an established fact; and full credit should be given to those who have accomplished this difficult task. For years there were endless discussions, meetings, arguments, articles, as to the advisability and feasibility of a new steamship line; but eloquent speeches and cogent arguments proved equally futile in raising money, and the movement was fruitless. When the Pennsylvania Railroad, however, agreed to guarantee the bonds and take a majority of the stock of the American Steamship Company, success was assured. Supported by the strength of that great name, capital flowed in to the full amount required. Philadelphia has not only a national, but, in addition, the very strongest local interest in the success of these steamers; for such success adds to our prospect of making the Delaware really, as it is now sometimes termed, the Clyde of America. Iron steamships are now replacing wooden ones, and the iron shipbuilding trade has before it an indefinite expansion; and if we can prove to purchasers that their market is on the Delaware, it would be but a few years before we could show many such ship yards as that of Messrs. CRAMP & SON at Kensington.—*U. S. Railroad and Mining Register.*

MINING SUMMARY.

Colorado.

PARK COUNTY.

Correspondence of the Central City *Register*.

Mounts Lincoln and Bross are sister peaks, whose summits are about a mile apart, their base at timber line, and Lincoln is said to tower up 5,500 feet above the timber. They are smooth, round, and very pleasant to climb, compared with most of our range kings.

The summit is basaltic rock; next comes the limestone in alternate layers of blue and white; next comes quartzite and granite—all the formation pitches about fifteen degrees to the southeast. While the lodes are found in the blue limestone, they all pitch into the mountains at all angles and in every direction. There are as yet no indications of fissure veins. The mineral seems to be in pockets from the size of your hat to large deposits, eight feet across. From one pocket to another small stringers of mineral stand as sign boards to the eager owner, but in a good many cases the boys dig out the pocket and don't find the sign board. Many a vision of wealth has been shattered by a blow of the pick. The mineral is chiefly lead, with more or less copper, and is very pretty in its oxides and carbonates of blue, green and yellow. Some of it assays in the thousands, but 300 ounces per ton is a good average of the ore being produced.

The Moose, on Mount Bross, is the best mine here. The owners have out about sixty tons of beautiful ore, and it still pans. They are working about eight men, and want more, but can't get them. The Baker is just below the Moose and looks well, but not at present working. The balance of the lodes are flourishing prospect holes, each with a large shingle and a very large pile of ore.

The Lincoln lode, on Mount Lincoln, owned by Joe Cass and some other gentlemen from Denver, is shelling out some fine ore, said to run from 250 to 600 ozs. per ton. They have out about fifty tons of ore and now work about twenty men. The Wilson and the Red Bird, with Sikey's discoveries on the western slope of Lincoln, are fine prospects.

There are several others who have a good show of finding large quantities of rich mineral. The ground, however, is used up on both Lincoln and Bross, for prospecting. It has been closely scanned and all good float on the surface has been closely followed. If any more are struck, it will be by sinking to bed-rock for blind slide float. However, the lime formation crops out both south and west and every day the "boys" are finding new districts that will rival Bross and Lincoln. They are finding some fine silver veins, true fissures, in the head of Buckskin Gulch, about five miles south of Bross.

There was some talk that Prof. Hill would erect smelting works near the new discoveries. They are not yet completed and I think only commenced on paper. Mr. Peters, Territorial assayer here, says there are parties who will immediately erect works at the mouth of Buckskin Gulch. As usual all these rumors invariably precede the actual erection of works in a new district. It is undoubtedly true that the mines now opened could, if cash was offered, produce ten tons per day of $300 rock, and a great deal more of lower grade, and the country will not be developed until some one gets on his ear and builds either chlorination works or a furnace.

SUMMIT COUNTY.

(From the Denver Rocky Mountain News of Aug 14.)

In Summit County—from what I can learn—the placer mines are yielding better than ever since the early mining days of '60-'61-'62 and '63. The water supply, up to the present time, has been quite liberal, although now some of the lesser branches are failing too fast for the good of some mines.

FULLER & GREENLEAF are building near here, for mining purposes, a flume of considerable magnitude.

It commences on the head of South Swan River, about twelve miles from Breckenridge, but little below the timber line, and is to extend along the sides of the mountains in a southwesterly direction, covering Georgia, Humbug, American, Dry Monitor and other gulches, known to be rich, and supposed to contain millions of money. At the head of the flume the company have built a saw mill having a capacity of ten thousand feet in twenty-four hours, where all the lumber is cut and the timbers made ready to put in the flume. The mill and flume give employment to sixty men, and they expect to complete five miles of the flume this season. Its entire length will not be far from fifteen miles. It will require over 200,000 feet of sawed lumber to the mile, and the total cost of construction is estimated at $5,000 per mile. When completed, it will carry the waters of the three forks of the Swan, together with some of the lesser tributaries, and its capacity from the middle fork will be 2,500 inches.

A. L. YOUNG is working in Georgia gulch from five to seven men and is realizing from $10 to $15 per day to the man. Hitchcock works one man; Pete Iverson, one; George First, one; Thomas Clack, one; and Fuller & Greenleaf, six. They are averaging not less than $10 a day of ten hours, gross receipts, to the man. Georgia gulch is not more than a mile in length, and it is estimated that not less than $3,000,000 have been taken out of it; still it is yet immensely rich. As high as 160,000 have been taken from one hundred linear feet in the center of the gulch.

Five men are working in Iowa gulch for STAHL & ADAMS. This mine is worked by booming, they not having handled a shovelful of dirt this season. Since the middle of June they have cleaned up over $1,0 0, and all above the flume on the bed rock remains untouched. The mine produces coarse heavy gold, and when a bed rock clean-up is made they expect to realize $50 a day to the man, as the result of their summer's work. STAHL & ADAMS own the entire gulch, or 6,000 feet in length by 1,000 wide, and every foot of it prospects very remarkably rich. A boulder weighing over two hundred pounds was taken from this mine, and it is actually seamed with gold. Another very rich mine is the Stogsdell patch, owned and worked by STOGSDELL & TWIBELL. They are working four men, with hydraulics, and they obtain from $25 to $35 per day each; $2 to the pan is a common occurrence at this mine.

In Galena gulch, RILAND & ROBY are working ten men in two pits. They are using hydraulics, working day and night. Six men took out thirty and one-half ounces in six days, working ten hours, from this mine. The company are only fairly at work as yet, and expect to do better soon. Mr. ROBY has in his possession three beautiful nuggets taken from RILAND & ROBY'S mines in Galena gulch that weigh as follows: one, four and one-half ounces, one, fifty seven pennyweights, and one, fifty-two pennyweights, all pure gold but the large one, which contains a little quartz. MIKE COURTNEY is working three men on side claims in this gulch, but I did not learn how well they were doing.

At Buffalo Flats, MUMFORD is working nine men, and is taking out from $8 to $10 per day to the man. He has an almost unlimited amount of ground—much of it known to be rich. Adjoining MUMFORD, Mr. NOLAN is mining with three men, averaging about $7 to the man. Next comes BLODGETT & MAJORS, with three men, and $10 a day to the man. They have eight hundred feet of flume, and are prepared to save all the gold they shovel up. In Gold Run, we first come to the TIFFEN & Co.'s mine. They are in good pay and working six men Their last clean-up was one ounce per day to the man. This company own a large amount of valuable mining property, and are preparing to mine on a large scale. MOFFATT & SHOCK work only themselves, but they have taken out one hundred ounces since the first of June. Their mine is one among the best. WALKER is mining with three men, and from $8 to $10 per day to the man is about their average. L. PEABODY is working six men; four by day and two by night. He has two pits with one hydraulic at each pit, and four hundred feet of flume. About $10 a day is the general average of this mine.

About two miles below Breckenridge, on the north side of the Blue, J. M. JONES is booming on the "Yuba dam." He has sixty feet of flume, and is making in a regular way from $4 to $7 a day. FULLER & GREENLEAF are booming Mayo and Negro gulches with sixteen men. They own a large amount of territory and are in a fair way to control the water of these diggings. When their works, now under contemplation, are completed, they ought to take out a vast amount of money.

SISLER is running a hydraulic on the Stillson Patch, and realizes $8 a day. He has ground enough to last him a lifetime; but if it continues to yield him $8 a day, he will not have to work all his life to get a fortune.

The Blue River mining company on Stillson Patch, are working nine men. They have extensive works and their mine is reputed to be very valuable. When their works that are in progress are completed, they expect to take out $1,000 a week. J. H. STAHL is superintendent. MOWER & HANGS are running a hydraulic on the Stillson Patch, working three men and taking out good wages.

Opposite town, on the west side of the Blue, JONES & GREENLEAF are constructing a large reservoir for mining purposes. It has a face two hundred feet long, eight and one-half feet high, and runs back one hundred feet. The outlet is five by four feet, and a volume of water is to be let in sufficient to fill it every twenty minutes.

On the east side of the Blue, and a short distance below Breckenridge, the Springfield Mining Company have extensive placer works. They have fifteen hundred feet of flume, work from twelve to fifteen men, and handle a vast amount of material. How much money they are making I am unable to say.

The Badger Mining and Fluming company are working six men in French gulch. This company own five thousand two hundred feet of the gulch, extending from bank to bank. They are not yet down to the bed rock, but the ground prospects well from the grass roots down. J. F. TABER, a careful and skillful miner, is one of the stockholders and the superintendent; the other members of the company belong in Denver. As they have made no clean-up yet this season, of course I am unable to say how well they are doing. The mine prospects from fifty cents to $10 to the pan on the bed rock.

GEORGE N. DAY, at the upper flumes in French gulch, is working seven men and realizing $10 a day of ten hours, to the man. He owns three thousand five hundred linear feet of the gulch, and fifteen hundred feet of rim rock claims, under the Jeff. Davis patch.

C. P. CLARK employs from three to seven men. This entire mine is conducted on a snug and profitable basis. Some of Mr. CLARK'S ground has paid as high as $40 a day to the man, and even now it is yielding a steady income every day. Several distinct and well-defined lodes cross this gulch on Mr. CLARK'S property. The ores of all that I examined carry galena and black and gray copper sulphurets; and they are said to assay rich in gold and silver.

Up near the timber line, in Webber gulch, RIPPEY, COBB & CONNERS are booming away the side of the mountain, hurling rocks, trees and vast bodies of mother earth to the valley below. How much gold they are getting is unknown; they will make no clean-up until fall. This company own a large area of gold bearing territory, and a controlling influence in the waters of Upper French gulch. Another year they will be prepared to do mining on a more extensive scale.

On the Jeff. Davis patch Baldwin & Fellows are booming for the purpose of exposing the rich streak that has rendered those diggings so noted. Todd & McFarland are working from four to seven men, below C. P. Clark's mine. J. P. Markesbery is mining in Soda gulch, about ten miles below Breckenridge. He has six thousand feet.

I presume there are other mines and mining companies in this district that have escaped my observation, but I have visited and carefully examined about all of them, and I find, with very few exceptions, that the miners are doing well, and some of them are making money very fast. There are no idlers in all this region of country, and I have yet to see the first despondent or downhearted man. They are, without exception, full of encouragement, and as busy as bees. There is less brawling dissipation than we naturally expect to meet with in a prosperous mining camp like this.

This is unquestionably a rich placer belt, but the seasons are short, and to crowd eight months into four, many of the mines are worked day and night. There are enough rich placers in Summit County to last all who may desire to work them, for a hundred years to come; and long before they are exhausted the lodes will be yielding up their golden stores.

Nevada.

WHITE PINE COUNTY.

We extract the following items from a correspondence in the *Mining and Scientific Press* of Aug. 10. The

ORIGINAL HIDDEN TREASURE

Was located in November, 1867. It is an incorporation, owning 800 feet of the heart of "Treasure Hill," divided into 21,333 shares. The company's mines are located on the northern brow of Treasure Hill. The original owners made a fortune out of the Original Hidden Treasure, before selling to the present incorporation, by crushing its rich ores found on the surface. The Rathburn mine was purchased by this company and consolidated with the same. This mine has had an eventful history, being "Bulled and Beared," paid dividends, and levied assessments by turns. It is certainly the richest mine on this hill, and under its present management, if not interfered with for the next sixty days, will prove so.

THE WHEELER TUNNEL,

belonging to this company, is now in about 315 feet, and from the present indications will strike the main ore body inside of 30 feet. Should they find the ore of paying quality, and quantity in this tunnel, a perfect furore in this stock is imminent, for it will not only prove that they have 600 feet of ore above them (the distance to the top) but will settle the question with all the other mines on this hill, that the main bodies of ore are deep down. This company are at present working 65 men. They also own what is known as the

BIG SMOKY MILL,

which is kept constantly running on the ores taken from their mines. It is located in the suburbs of Hamilton, has 20 stamps with a reducing capacity of 20 to 22 tons of ore per day (24 hours), run by steam. Springs belonging to the company furnish them with free water, a big item here. Next in order is the

PENNSYLVANIA MINE,

located in June, 1868 and embraces 400 feet on the great ore belt of Treasure Hill; it joins the Hidden Treasure on the south. Incorporated capital stock $2,000,0 0, in 20,000 shares.

The present working consists of two shafts, one down 40 feet, rigorously worked day and night. At about 20 feet more depth, ore will certainly be found, from indications. Working regularly six men. The next below is the

EAST SHEBOYGAN MINING COMPANY.—(LIMITED,)

head-quarters, London, England; 47,500 shares; £2 par value; commenced work one year ago. Tunnels and shafts explore the ground 300 feet in length, and 141 feet in depth. Ore found the whole length of present works. The vein varies from 4 to 15 feet in thickness, and the ore runs from $25 to $45 per ton. The mine is situated half a mile north of the O. H. Treasure.

The Silver Glance, belonging to the same company, is situated 1,500 feet southeast of the Eberhardt mines. It has been worked since the commencement of the present year. The present works are carried on for the purpose of fully developing the property. The ore body so far as discovered, is 200 feet in length, and 15 feet thick; average grade, $35 per ton. The superintendent of the company's property is William Rogers of London; A. J. Brown, residing superintendent.

MISCELLANEOUS.

THE
MECHANIC'S MAGAZINE
OF
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NEW PATENTS, AND ALL MANUFACTURES, ENGINEERING, BUILDING, RAILWAYS, TELEGRAPHY, SHIP-BUILDING, FACTORY NEWS, ETC., ETC.

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has requested their undersigned agent to negotiate for either consignments or the purchase of American Lead and Zinc Ores. Parties in possession of such ores may find it to their advantage to address for particulars to

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MISCELLANEOUS.

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FOR LEASE
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The UNION MINING COMPANY, Proprietors of the old MOUNT SAVAGE IRON CO., offer for lease their Blast Furnaces (two) of 13 and 16 feet bosh respectively, capable of producing 300 tons per week. The situation of these Furnaces in the heart of a country offering coal and limestone of the best quality at the lowest cost, and within short and cheap reach by railway connection of the ore-beds of Pennsylvania, presents to capitalists a favorable opportunity for investment. Within a few weeks a thorough connection by rail between the Furnaces and Philadelphia and New York will be completed. For terms apply to

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New Patterns, of any desirable weight, made to order on Short Notice.

We respectfully solicit orders for New Rails, or Re-rolling. June 25.1y

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100,000
TONS SCRANTON COAL.
On WEDNESDAY, AUGUST 28th, 1872.

NEW YORK, August 21st, 1872.

The Delaware, Lackawanna and Western Railroad Company will sell, by MESSRS. JOHN H. DRAPER & CO., Auctioneers, at the Company's Sales Room, 26 EXCHANGE PLACE, corner of William Street, NEW YORK, on WEDNESDAY, August 28th, at 12 o'clock, noon,

100,000 TONS
OF
COAL, FROM THE LACKAWANNA REGIONS,

of the usual sizes, deliverable at their Depot, Elizabethport, N. J., during the month of September, 1872.

The sale will be positive; each lot put up will be sold to the highest bidder; no bids, in any form whatever, being made for account of, or on behalf of the Company. The conditions will be fully made known at the time of sale.

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MISCELLANEOUS.

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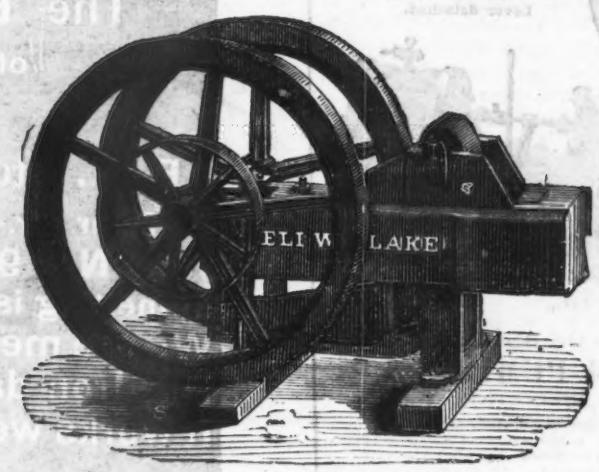

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This machine has now been in use, enduring the severest tests, for the last ten years, during which time it has been introduced into almost every country on the globe, and is everywhere received with great and increasing favor as a labor-saving machine of the first order.

Illustrated circulars, fully describing the machine, with ample testimonials to its efficiency and utility, will be furnished on application, by letter to the undersigned.

☞ The Patents obtained for this machine in the United States and in England having been fully sustained by the courts, after well contested suits in both countries, all persons are hereby cautioned not to violate them; and they are informed that every machine now in use or offered for sale, not made by us, in which the ores are crushed between upright convergent facesor jaws actuated by a revolving shaft and fly-wheel, are made and used in violation of our patent.

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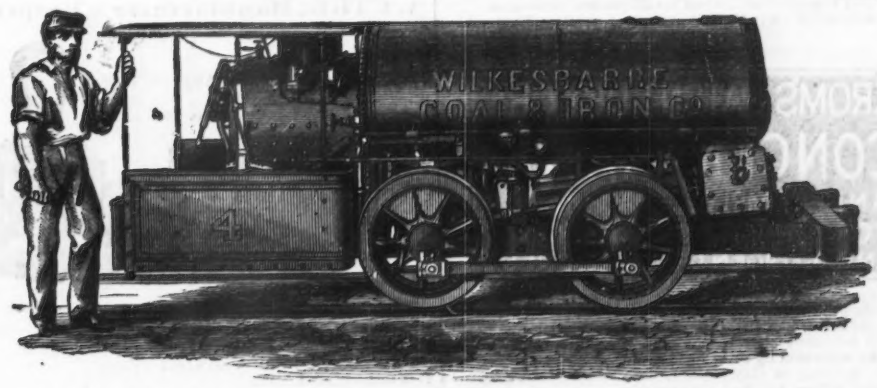

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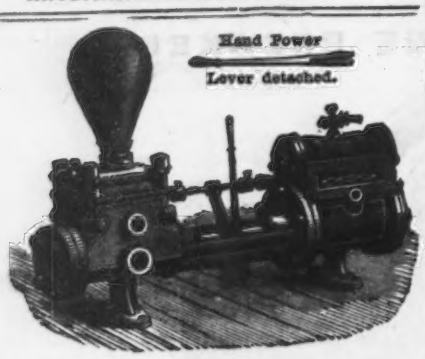

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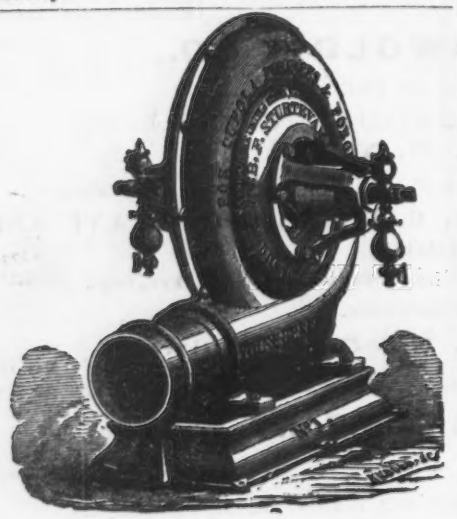

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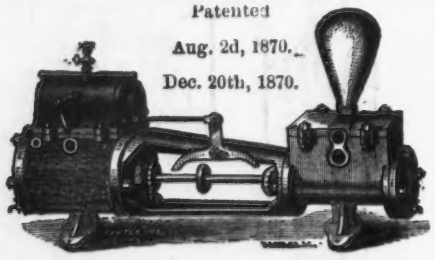

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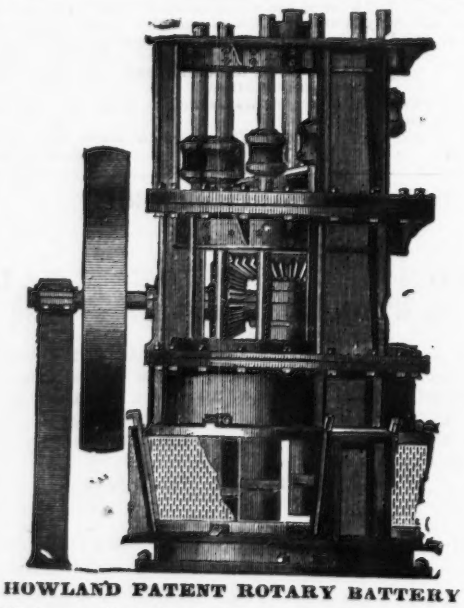

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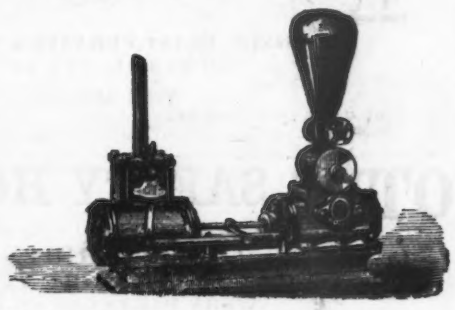

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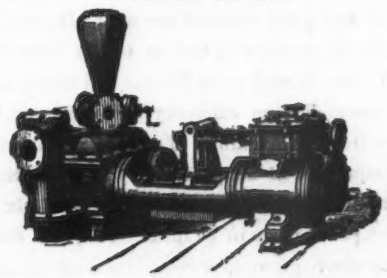

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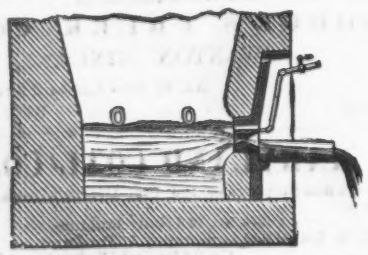

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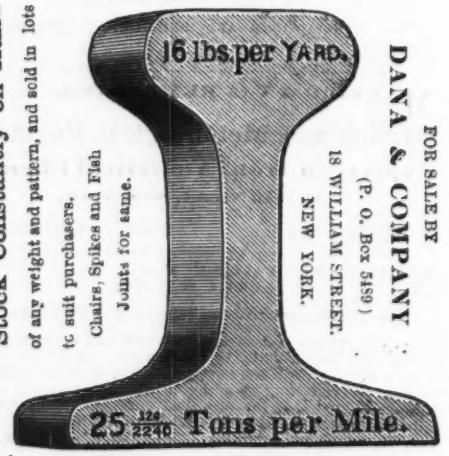

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